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THE
FLORAL WORLD
GARDEN GUIDE

AND
COUNTRY COMPANION.

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THE FLORAL WORLD

AND

GARDEN GUIDE.



ROCKWORK.



IF all the mistakes that are made in the embellishment of gardens, the rockery is but too frequently the most ridiculous. If we stroll through any of the popular places of out-door resort, we are sure to see plenty of rockeries and raised banks; they abound in place and out of place, and when they *are* appropriately placed it is after all a matter of chance, because, as they are sprinkled about everywhere, some few, like seed scattered by the wind, are sure to fall in suitable situations. The same may in a certain sense be said of the rockeries in private grounds, and it really makes one feel melancholy to reflect upon the waste of money, time, and ingenuity involved in the construction of many of them.

Take a flower-garden, and in the midst of it make a pyramid of vitrefied bricks and flints, or throw up a hillock of huge stones, and set upon the top of it a small plaster statue, or a cast of Queen Elizabeth, or Shakespeare, or Paganini; daub the stones over with blue and green paint—in fact, moss them and bronze them, and use plenty of colour. Then stick in anywhere a geranium, a fern or two, put a few shabby lilacs at the back, and make round the whole a gravel-path, edged with white flints or brick-rubbish, to correspond with the eminence, and you have one of these “model rockeries” that delight Londoners when they take their walks abroad, and which many of them copy in arranging their own grounds. It is the best fun in the whole world to visit a garden where there is plenty of rock-work; but you must be reticent as to your opinion of it, or risk all the consequences of giving an unforgivable offence, if you should speak your mind upon the matter.

Rock-work of a certain kind is admissible almost anywhere—in a tank of marine fishes, in a tank of river-fishes, in a fern-shade, in the basin of a fountain, at the point where walks meet in flower-gardens, and as objects on which the eye may rest in walks through lawns, shrubberies, and wilderness scenery. But in every case the

material must be adapted to the work, and in all coloured and formal scenes, the rocks should be used in huge blocks in piles and mounds, not to imitate caverns and rude cairns, but strictly as ornaments to set off the beauties of other objects, or to give light or shadow as the case may be. This is rock-work, not rockery, and it involves the disposal of rough blocks in symmetrical masses or groups, not in wild and fantastic outlines, and it conveys the idea of artistic repose, not natural and rugged sublimity. The two ideas must not be confounded, for while a *rockery* may be a most fantastic, gloomy, romantic, or savage scene, according to the desire of those who construct it, and its fitness in this or that form to the scenes in which it occurs, *rock-work* must be artistic and elegant, every puerile conceit banished from it; and the rough unhewn material used simply, because *that*, in the hands of an artist, may be made as appropriate and beautiful as the exquisitely sculptured forms which the chisel *might* have obtained from it. We put rocks in cabinets, and a mighty block of granite may be quite appropriate even on the terrace garden, and there, indeed, it may serve as a memorial of an event worth remembering.

Suppose you have a neat little flower-garden, with a wooded lawn adjoining. This lawn, especially if it has a border of fruits, will be as frequently resorted to as the walks through the parterres. Your long walks under embracing branches will be pleasant at all seasons, but much more pleasant both to you and your visitors if there are some few special arrangements made to please the eye. The gloom of green foliage is delightful, but how much is the joy of an avenue enhanced if light is seen at its termination. Now a border of shrubs, a bank of ferns, a bosky corner, or walks diverging into other scenes, may form the vanishing point of your perspective, and the calm shade has no relief therein. Let the gardener get together a barrowful of white stones of any kind, the larger the better, and let these be thrown down "any how" at the end of such a walk, and in an instant the entire aspect of the scene is changed. So far the object is accomplished; a bank of light stones is evidently just the thing to make the avenue charming. It is of course not to remain for ever a mere barrowful "flung into the void," but is to be built up neatly, and properly planted, and may at last become a cairn after the fashion of the adjoining figure.

Many uses for rock-work may be found, even in the immediate vicinity of the house and flower-garden. Wherever it is so used, it must be bright and artistic, pleasing the eye by contrast to the orderly lines that prevail around, yet harmonizing with sculpture, if need be, and with the bright scene it occupies, and its use made legitimate by a display of plants that trail elegantly, or that look best when spread over raised surfaces, as most alpine do. Then where mounds are used there is no better mode of constructing them than to form the foundation of brick-rubbish, and cover the whole with huge dark stones, or with those conglomerated bricks which are cast from the kilns as refuse. If alpine plants are to grow on such a rockery, there should be provided for them a good depth of sandy loam, for unless they can root deeply they will not thrive.

Ivy grows slowly at first ; it taxes one's patience when it is wanted as a distinct furnishing element, and while it is in progress the appearance of the mound, if tastefully built, is at least pleasing. Annuals of quiet colours and a few greenhouse perennials may be put out on the pile, and neatness and completeness may thus be attained at once, and the smaller aids dispensed with as the ivy makes its second spring growth, and promises to cover the whole with its glossy wealth of green. In the planting of ivy in these mounds strong plants should be employed, and April is the best season to plant them.

Now as to another sort of rock-work for the strictly ornamental ground, let us take even the smallest of suburban or town gardens, measuring say from sixty to ninety feet in length, by from twenty to thirty in breadth. The garden is bounded on three sides by walls, and on the fourth by the house. It is laid out with a central grass-plot and flower-beds. Around the walls runs a narrow border, separated from the grass-plot by a continuous path. The walls must



be covered with ivy, clematis, jasmine, and other climbers ; and if the evergreen shrubs are well disposed, and the flowers grouped in good masses of colour, the scene will be pleasing, and afford as much space for gardening labours as most people having but moderate leisure will be able to cultivate. Let the border under the rear wall be raised into a bank, with a facing of large burrs, such as are supplied for the purpose, the lower tier being sunk a few inches below the surface. A few large rough blocks of limestone, or any other grey or dark rock, may mingle well with the facing ; and on the upper tier some large dark flints may be set. The mass of the bank is composed of rich sandy loam, and the rock-work is so arranged that there are plenty of interstices for the insertion of plants in the front. A white poplar, birch, or tree of any kind, will be an improvement if planted towards one side in the midst of a

mass of hollies and junipers. The bank should have either a concave or a convex outline, but there should be no "ins and outs" about it in so small a space, one good curve being quite sufficient. Towards the adjoining borders it should slope into the general level of the garden, but the level of the bank should not be uniform throughout—one side should rise higher than the other.

Now plant the wall behind it with ivy, virginian creeper, white jasmine, or any thick, shrubby, and *dark* climber. Fig tree, pyrus, or clematis would be suitable, but a dark background will be most effective. The surface of the bank may then be planted with showy flowering plants of almost any kind, and the front rock-work with a few good alpiners, or some bright verbenas, heliotropes, hawkweeds, yellow and white alyssum, and in one corner ivy, which should be trailed over the stone into a rich knoll, so as to contrast with the flowers beside it. The slopes adjoining the side borders should be studded with crocus, snowdrop, narcissus, jonquil, crown imperial, gladiolus, and other good bulbs, so that at all seasons they will glow with colour, and be crowded with a gay pendant foliage. On a few ledges in front of the bank a few ornamental grasses would look well, while, as a matter of course, the several choice varieties of stone-crop, houseleek, and such favourite alpiners, will not be forgotten.

From the house such a bank would be at all seasons beautiful. Its elevation and the mingling of various-coloured foliage and flowers in the dark rock-work, which every year would improve with weather stains, would render it a pleasing background, and prevent the eye from wandering beyond. Yet this would not be a rockery strictly, but a raised bank, faced with stones and clinkers, and devoted to miscellaneous showy plants, rather than to alpiners. Smile not, ye redoubtable critics who take large views of things: a rockery of this humble sort, if well made and well kept, will make a blessed break in the murky monotony and customary flatness of a town garden.

Now every ornamental pile or mound may be treated in a manner similar to what I have just described for the bank at the rear of a suburban garden. Wherever you want a bit of rock-work build it up with one kind of material only—no mixtures of colours, no shells, no gingerbread of any kind. Let the mass be sufficiently bold, but subordinate to the general scheme of the garden, for it is not in any case to form a special object of attraction, but is intended only to diversify the colouring and character of the scene. Within a considerable distance of your house it ought to be impossible for you to say to a friend, "Come and see my rock-work," because it should have no special importance at all. But in making it subsidiary it may still be beautiful. In a dark bowery spot, where light is wanted, it should be formed of white stones; in an open space where a dark mass would give relief, there use the refuse of the brick-kiln or furnace slag, using large blocks only outside; the small stuff will do for the foundation.

Where a few large blocks are used to adorn a terrace or a lawn, they ought to be handsome specimens of some interesting stone, such as two or three immense blocks of granite, or porphyry; they

must have majesty of aspect and richness of colour; and to give them a perfect right to the place they occupy, the owner should have a story to tell about them—when and where quarried, the cubic measurement and weight of each block, the nature of the strata to which they belong, and whatever details of geological or geographical interest may attach to them. If a philosopher can give you a four hours' lecture on a wayside pebble, surely your mineralogical ornaments must be capable of yielding some items of amusement and instruction.

About flower-gardens, and all bright orderly scenes, every bit of rough stone should be made beautiful with flowers. A very few plants will in such cases produce an effect, for there is no position in which flowers look more grateful to the eye than when springing from the clefts of a boulder, or the sides or summit of a dark mound. The eye is arrested at once, and art seems to have set a chaplet on the brow of nature. All creeping and trailing plants that flower gaily, and that endure a season, are suitable, except of course those of large growth; and where the bank does not offer a suitable soil for them, ten minutes' labour with a trowel will suffice to remove a stone or two, or the soil from between them, so as to make room for sufficient of the proper compost in which the plant will prosper. If sandy loam, with a moderate admixture of leaf-mould and well-rotted manure, is used in the construction of the mound, a foot deep all over its exterior, there is scarcely anything you may wish to plant in it but is sure to flourish. Plants that spread or trail, such as geraniums, verbenas, and petunias, will suit better than those of stiff growth, such as asters or chrysanthemums. They should be gay ones too, and but *sparingly* planted.

For very dry elevated positions the most useful deciduous trees are Thorns, Caraganas, *Halimodendron argenteum*, *Kolreuteria paniculata*, *Althæa frutex*, *Euonymus europæus*, *Gleditschia horrida*, *Ornus europæus*, *Pyrus aucuparia*, *Rhus cotinus*, *Rhus glabra*, *Rhus typhina*, *Robinia pseudo-acacia*.

The evergreens most likely to thrive in dry elevated sites are common Box, Holly, several species of *Cistus*, *Cotoneaster*, *Grevillea rosmarinifolia*, *Rhamnus latifolius*.

A SELECTION OF ONE HUNDRED ALPINE AND HARDY PERENNIALS SUITABLE FOR ROCKERIES.

Achillæa millefolium rubra, *Alyssum saxatile compactum*, *Andromeda hypnoides*, *Androsace carnea*, *A. ciliata*, *A. lactea*, *A. obtusifolia*, *Anemone vitifolia*, *Antennaria tomentosa*, *Arabis albidia*, *A. lucida variegata*, *Aretia vitaliana*, *Aubrietia Campbellsii*, *A. deltoidea grandiflora*, *A. purpurea variegata*, *Campanula aggregata*, *C. alpina*, *Cheiranthus alpinus*, *Chimaphila umbellata*, *Cistus formosus*, *Cyclamen coum*, *C. græcum*, *Dianthus alpinus*, *D. cæsius*, *D. glacialis*, *Dictamnus fraxinella*, *Erigeron speciosus*, *Eritrichium nanum*, *Erpetion reniforme* (elegant little plants of the violet family, well adapted for rockwork, growing in sandy peat, and easily increased by separating their runners. They require, however, protection

during the winter). *Euphorbia Portlandica*, *Gaultheria procumbens*, *Gentiana acaulis*, *G. Andrewsii*, *G. angustifolium*, *G. bavarica*, *G. ciliata*, *G. verna*, *Helianthemum formosum*, *Hepatica angulosa*, *H. triloba* (in its several colours of blue, red, and white), *Hypericum calycinum*, *Iberis carnosa*, *I. gibraltarica*, *Iris fœtidissima variegata*, *Linaria alpina*, *Linnæa borealis*, *Linum alpinum*, *L. flavum*, *Lithospermum fruticosum*, *Lychnis alpina*, *L. viscaria flore pleno*, *Lysimachia nummularia aurea*, *Mimulus cupreus*, *Myosotis dissitiflora*, *M. rupicola*, *Oxalis tropælioides*, *Phlox Nelsoni*, *P. frondosa*, *P. subulata* (admirably adapted for rockwork, as the stems are procumbent, and will hang down in a very graceful manner. The flowers are produced in great abundance in April and May, are generally of a delicate pink, with a dark eye. It is propagated by cuttings). *P. verna*, *Polygala chamæbuxus*, *Polygonatum roseum*, *Polygonum vacciniifolium*, *Primula acaulis* (in variety), *P. cortusoides amœna*, *P. farinosa*, *P. purpurea*, *Saponaria cæspitosa*, *Saxifraga aizoon major*, *S. cordifolia*, *S. cotyledon*, *S. hypnoides minor*, *S. oppositifolia*, *Scilla amœna*, *S. bifolia*, *S. siberica*, *Sedum acre aureum*, *S. glaucum*, *S. fabarium*, *S. hirsutum*, *S. purpurescens*, *S. sempervivoides*, *S. virescens*, *Sempervivum californicum*, *S. montanum*, *S. tectorum*, *Silene Schafta*, *Soldanella montana*, *Spiræa filipendula pleno*, *S. ulmaria variegata*, *S. palmata*, *Thymus azoricus*, *Tritileia uniflora*, *Tussilago farfara variegata*, *Veronica saxatilis*, *V. dentata*, *Viola cornuta*, *V. lutea grandiflora*, *V. pedata*, *V. suavis* The Czar.

THE CULTIVATION OF THE AZALEA.



THE Azalea Indica requires, speaking generally, the same treatment as the camellia, but instead of a loamy should have a peaty soil. As it is an easy matter to propagate them we shall begin with that part of the subject. It is an easy matter to procure seed, as the single varieties produce plenty. Sow as soon as ripe in pans of sandy peat, and keep in a moist heat until started. Cuttings should be made from the shoots of the season when nearly but not quite ripe. The new varieties are generally sent out grafted on seedling stocks. The last method is a very simple affair of crown or cleft grafting, easily learnt and requiring only a little practice to make perfect in it. However, we recommend the amateur to obtain ready-made nursery plants, for azaleas are never needed in such quantities in a private garden, as to render the propagating of the varieties worth the acquisition of the "knack" which is the key to success.

The best time to buy is in the spring. When the plants come home examine them well, as it is possible they may be infected with thrip, the sign of which is a sooty deposit on the under sides of the leaves. If they appear to be thrippey, shut them up and give them two doses of tobacco smoke, not only to cleanse them but to prevent the spread of the destructive pest. When the plants have flowered

and begin to grow, put them in pots one or two sizes larger. The compost usually employed is one consisting of peat five parts, and



AZALEA VARIEGATA SUPERBA.

one part sand, but we prefer equal proportions of silky yellow loam
January.

full of the roots of grass and tough fibrous peat, with a sixth part of the whole bulk of silver sand.

Azaleas are strictly greenhouse plants, but they receive immense benefit from the assistance of a genial temperature when making their growth in the spring. When the stock is fresh potted, place it in a temperature of about 65°, and maintain a healthy atmosphere by frequently sprinkling the paths and stages; also syringe overhead lightly morning and afternoon. Water sparingly, because the roots are too much deranged to take up a large supply; and, to keep up the balance, the evaporation must be checked in the manner pointed out above. Hundreds of azaleas are killed annually through improper watering, for they are remarkably impatient of being tampered with at the roots. It is a very common practice to give just sufficient to wet the soil to a depth of three or four inches below the surface, without troubling to ascertain whether the lower portion is wetted or not. When once the lower part of the ball gets dust-dry, it is no easy task to moisten it without dipping it into a vessel of water. When any plant looks sickly, or evinces any flaccidity in the leaves, and the soil is moist on the top, turn it out of the pot, and probably the soil will be found dust-dry at a few inches from the surface. The water should always run through the hole in the bottom of the pot after its application, and you should continue to fill up the space on the surface until it does. Guard against giving too much water at the roots, for that is as injurious as an insufficient supply.

Give liberal ventilation as soon as the stock has recovered from the check received in repotting, and increase it as the growth progresses. Although a moist and warm atmosphere is essential to a healthy growth, it must not be kept too close, or the shoots will be weak and long-jointed. When the growth is completed, harden off by opening the ventilators night and day, and then place out of doors, in a shady and rather sheltered position, until the middle or end of September. A light, airy greenhouse, with a temperature of 40° or 45°, is all that is required during the winter months; and give the treatment already advised during the following spring and summer. Good specimens can be, and are, grown without a taste of artificial heat, excepting what is necessary to keep the frost out; but to grow them like the magnificent specimens staged at the metropolitan exhibitions, the preceding directions must be strictly followed.

When a nine-inch pot is reached, a shift once in two years will be quite often enough, unless large specimens are required at the earliest moment possible. Extra care will be requisite in watering during the second year, to prevent them suffering from drought, without keeping them too wet. Water with rain-water at all times, except when they are making new growth the second year after a shift, and then water with weak liquid manure, made by steeping sheep or cow-manure in rain-water, and allowing a sufficient time to settle before using. It should be diluted with soft-water until paler than pale ale.

With regard to training the specimens into shape, the pyramidal

form is perhaps the best. Those who intend to train should take them in hand in a young state, for it is a difficult affair to get an old plant into shape after being allowed to grow wild for several years.

The single and double azaleas are grown in precisely the same manner, and in any case the double varieties should, on account of their fine characters, have a conspicuous place in even a small collection.

BALCONY AND AREA GARDENING.

BY JOHN R. MOLLISON.



Of late years balcony and area gardening has become very fashionable in some parts of London, and others of our large towns. The art is only in its infancy with us as yet, but by-and-by, instead of being confined to a few streets and squares, we shall see the balconies and windows everywhere draped with verdure and gay with countless flowers of every hue. On the Continent this style of town gardening is carried out to a far greater extent and in greater perfection than with us. Of course our climate will never allow us to compete with our continental neighbours with anything like success in this matter, but still, a very great deal more might be done. A roomy, well arranged balcony, with its little rockery, flower-pots, and boxes, and creeping plants, is one of the best, cheapest, and most enjoyable of town gardens, a never-failing source of pleasure, and a very oasis in the desert of town life for the wearied eye to rest upon. It is surprising how flowers and plants will flourish in a balcony or area garden, if suitable plants be chosen, and well supplied with water, both at the roots and overhead. A daily syringing or overhead watering with a fine rose is one of the necessary attentions to be paid to them in this situation. Without this daily washing, your balcony or area gardening soon gets dusty and unattractive. In the morning before the sun is very strong is the proper time to do it. In dry warm weather the plants should all be watered at night after sundown. It is very refreshing to them after a hot dusty day, and braces them up for the coming morrow.

The best way to cultivate flowers on a balcony is by means of boxes, which are preferable to pots, as they do not dry up so soon and the roots of the plants have more nourishment and room to spread. The best sort of soil is the same as that recommended for window boxes. And no lack of useful flowers need be experienced, for nothing looks better on a balcony than some of our hardy common flowers which may be bought in the market for a few pence per dozen, such as *Wallflowers*, *Stocks*, *Arabis*, *Daisies*, *Hepaticas*, double and single *Primroses* and *Polyanthuses*, *Pansies*, *Violas*, and *Forget-me-nots*, and *Auriculas*, not forgetting the splendid, hardy border

plant so suitable for pot culture, *Dielytra spectabilis*, with its graceful drooping spikes of rosy pink flowers. These are the standard spring flowering hardy plants so fashionable now for spring gardening. They flower in conjunction with the grand display of spring flowering bulbs.

Among spring bulbs we have first the noble *Hyacinth*, with its magnificent spikes of fragrant waxy-looking bells, of nearly every shade of colour. You need not purchase the new or costly named



A BALCONY GARDEN.

sorts of this charming flower. Older sorts for spring display in masses can be had very cheap, and flower just as well and sometimes better than the costly sorts. The *Tulip* is the Queen of Spring flowers, and the grandest of all for balcony display. Nothing can excel the effectiveness of a mass of its magnificent blooms. They can be had for a few pence per dozen. The *Tulip* is closely followed in the order of merit by the *Crocus*. Every one knows and loves the charming little *Crocus*, with its yellow, blue, white, and variously

coloured flowers. They are very cheap, from two and sixpence per 100, so you could have masses of them in bloom on the balcony with little expense, and they make a really gorgeous display in connection with the hyacinths and tulips. There is also the *Polyanthus narcissus*, of sorts, the *Daffodil* and the *Muscarias*; all very good, but not so showy as the gorgeous trio, the hyacinth, tulip, and crocus. And last but not least we have the virgin white *Snowdrops*, single and double, the harbingers of spring—the firstling of the year—the little friend we all welcome so gladly. All these spring flowers and bulbs usher in the season of balcony and window gardening with a burst of freshness and beauty. They begin with the snowdrops in February and continue in rotation through March, April, and May, till the summer flowers come in to take their place.

Hardy spring plants can be purchased in spring and planted in boxes when you get them. But spring bulbs should all be planted in their boxes in October or November, and kept in any convenient closet or cellar till the days begin to lengthen out again, when they can be placed in their proper quarters; or, better still, if you have any convenient place to grow them in till they are nearly in flower, and they will make a grand display on the balcony at once when placed there.

When planting your bulbs you can arrange them as you intend them to flower, either in masses of each kind in one box, or mixed together. A very good arrangement is to have them in lines, *Tulips*, *Hyacinths*, *Crocuses*, or *Snowdrops* alternately; however, your own taste will guide you in this. Remember to plant all bulbs, except the hyacinth, below the surface; the hyacinth should have the top of the bulb above the surface of the soil.

As the spring flowers die out, the summer flowers will begin to take their place, and cause your balcony garden to have quite a different appearance altogether. Masses of gorgeous flowers, luxuriant creeping plants, and fresh foliage of *Ivy*, *Virginian Creeper*, *Clematis*, *Grape vine*, etc., will give it a truly rich and sumptuous appearance.

Summer bedding plants all do best planted in boxes, although you may have several specimen geraniums, fuchsias, lobelias, etc., in pots, for moving about, handy; but all small plants in pots, either on the balcony or in the window, should have their pots plunged in boxes among moss or sand, they thrive far better with their roots protected thus from the sun's heat.

For area gardens nothing is better than a few hardy plants, such as *Agave Americana*, *A. variegata*, *A. horrida*, *Aloe Africana*, *Aloe pieta*, and *A. variegata*, *Yucca aloifolia*, *Y. aloifolia variegata*, plants of *Ivy* in tubs trained on wirework, and such shrubs as *Hollies*, *Laurels*, *Boxes*, *Arbutus*, *Mahonia*, *Aucuba japonica*, *Junipers*, *Yews*, and several other varieties of conifers; not forgetting the *Rhododendrons* that are so gorgeous when in flower in the early summer. All these plants and shrubs should be grown in wooden tubs painted green. They are an everlasting decoration, standing all the year round, only requiring the dust and soot to be washed off them by syringing, and never being allowed to get dry for want of water.

In an area no flowers would do so well as the common *Wall-flower*. Seeds of it should be sown, and plants planted, in every spare piece of ground, and at the bottom of the walls. An excellent fern case could be built in an area. It has just the amount of shade and coolness required by ferns. There in a neat glass case, to protect them from dust, they would thrive well.

The *Virginian creeper* and the *Grape vine* should be planted and trained over the area walls in conjunction with the *Ivy* and *Wisteria sinensis*. The last is an excellent town plant, and though it may not produce its lovely clusters of mauve pea-shaped flowers, still, its elegant drooping branches and pinnatifid pea-green foliage has a very pleasing effect.

The *Virginian creeper* is the best of all climbing plants for town gardens. It drapes the walls and balcony railings with a dense living green all through the summer, changing after August into different shades of rich brown and fiery crimson. It should be planted and trained over every unsightly gable and bare wall. The common *Grape vine* also makes a capital town plant, contrasting well with the *Virginian creeper*. They should both be planted in the area below, and a barrowful or two of good rich soil given them to make a fair start. As they grow they can be trained up the walls, anywhere you wish them to grow. They may also be grown in wooden tubs and placed upon the balcony, where they can be draped along the railings, or trained over the walls, or round the windows. The common *Ivy* is an excellent town climber, ready to adapt itself to all circumstances, covering walls, draping railings, hanging in graceful festoons from baskets, or making trained specimens in pots. Its evergreen leathery-textured foliage has ever a warm cheerful look, and should always be grown in conjunction with the *Grape vine* and *Virginian creeper*, which are deciduous, that is, they lose their foliage in autumn. These are the balcony and area climbing plants "*par excellence*." No other climbers succeed so well as they do, although the *Honeysuckle*, *Ayrshire Roses*, *Crimson Boursault Rose*, *Gloire de Dijon*, *Charles Lawson*, and several other climbing roses, do very well in towns where the situation is open and airy. The several varieties of hardy *Clematis* can also be had to flower nicely in the same position; as also the *Jasminum officinalis* or common Jasmine, and the *Cotoneaster microphylla*, having a profusion of reddish berries.

Of annual flowering creepers the best are the gaudy *Nasturtiums*, the pretty canary creeper, *Tropæolum canariensis*, the *Scarlet Runners*, and purple and white *Convolvulus*; to which we may add, though not an annual, the *Lophospermum scandens*, a very good greenhouse trailing plant, suitable for balconies and basket-work. The other are grand for draping railings, embowering windows, and twining round baskets with wreaths of blossoms and foliage. They require the aid of twine or wire trellis to cling to, and should be sown in boxes of rich soil and have a liberal supply of water.

For large specimen plants for the furnishing of balconies and areas, nothing can surpass the *Rhododendron* when in flower. Its magnificent heads of bloom, produced in luxuriant abundance, give

a balcony a furnished appearance no other flower can come up to. Next to it comes the *Azalea Indica*, one of the greatest favourites for spring decoration, and the deciduous *Azaleas*, coming into flower in early summer, and very lovely. Then there is the grand family of *Roses* in numerous varieties, the freest flowering and most useful being the old red *China Rose*. During summer several of the *Palms* and *Cycads* may be placed on the balcony for contrast, and during the winter months *Hollies*, *Aucubas*, *Laurels*, *Boxes*, *Conifers*, *Agaves* and *Aloes*, can be placed to keep it furnished.

As the summer flowers lose their beauty, the *Stocks*, *Asters*, *Marigolds*, *Phlox Drummondii*, and *Chrysanthemums* will keep up the display till frost kills them down. The *Phlox Drummondii* is one of the prettiest and most useful of annuals for all purposes, and the *Chrysanthemums* are the last flowers of the season for outdoors; then only the hardy shrubs are left, and the Ivy holds principal sway, draping the balconies with its never-dying freshness, and drooping in graceful festoons from hanging baskets, for which purpose it is the best of all plants, remaining healthy and green through summer and winter.

Hanging baskets for balconies should always be of a good size. Small baskets are nearly useless, drying up quickly and never at all satisfactory. A basket two feet across hanging from the underside of the balcony, and filled with green and variegated Ivy, pegged close round the sides, and a few other flowering plants filling up the centre, is just the thing for a balcony. For the winter months when the flowers are dead, a plant of *Aucuba*, or golden or silver Holly, in the centre would make it up again for the season.

The basket should be lined with moss to prevent the soil coming through the wires. The Ivy roots nicely through the moss when pegged close round, and forms a green covering, not only hiding the wires and moss, but protecting the roots of the plants inside from the scorching rays of the sun. Early spring is the best time for filling a basket, and then you may put a few late *Crocus* bulbs among the moss; they would flower out from the sides of the balcony basket very prettily. A pot with a small variegated shrub would fill up the centre till the risk from frost is past, to allow *Geraniums* and other tender plants being put in.

It is quite possible to have a small and interesting rockery on a balcony. If the floor of the balcony is of stone, a sheet of zinc cut out to the shape you wish your rockery to be, and the edges turned up all round something like a flat box, with a gentle incline to one open corner for the draining away of superfluous water, should be laid on the stone, and your rockery built upon it. Where the floor of the balcony is of perforated metal, the sheet of zinc need only be flat to keep the soil from falling through, with several small holes punched through it to aid the drainage, and you can then heap your soil for the rockery about it. Very choice burrs, pretty stones, and shells should be chosen, for the rockery must be very select and neat. Several small *Ferns*, *Echeverias*, *Sempervivums*, *Saxifragas*, *Sedums*, and small plants of *Aubrietia*, and *Linaria*, or any other dwarf plant, only should be used, for the space being confined, only a

little tiny rockery can be got up, and the rock-plants must be in proportion to its size.

The same may be said of the area. A rockery for ferns would thrive there very well, and be a very interesting object to my city readers, who seldom have a chance of beholding them in their native haunts. The shade and protection afforded by an area is just the thing required for ferns.

I can fancy a fern rockery built up against the area wall around the root of a robust Ivy, where the graceful fronds of the ferns and the pretty little *Linoria* and *Sedums* form a natural rustic bank from which the ivy seems to spring, rockery and ivy forming together a picture of beauty.

The common hardy British ferns are the kinds to cultivate in the area rockery. Always be particular to water them gently overhead every morning and evening during the season.

There are a great many contrivances in the way of baskets, brackets, flower-stands, and rockeries which a person of some taste and ingenuity can work out. It only requires an imaginative mind, and proper means and appliances at hand, to contrive and work out numberless little inventions for the embellishment of town gardens with the lovely flower and foliage plants now so cheap and plentiful.

The principal care of the gardener must always be that the plants be kept clean and properly watered, for it is a truly miserable sight to see town plants sickly and drooping for want of moisture, and begrimed with dust, as if neglect had claimed them entirely for his own. I do not believe any of my readers will allow their lovely flowers to reach that state of wretchedness.

THE AURICULA AS A BORDER PLANT.



THE great care bestowed upon the valuable named varieties, that is to say, the florists' auriculas, appears to place this plant at a disadvantage as one adapted for the borders. Yet we have not a finer border plant, provided it has proper treatment. The common border, in which all sorts of plants are grown, will suit them very well, as a peep into almost any cottage garden will suffice to demonstrate. But to enjoy them in an especial manner as border flowers, prepare for them a selected spot, facing north, open and breezy, and shaded from the mid-day sun in summer. There need not be any elaborate preparation of the soil, but a deep, well-drained, sandy loam is absolutely needful. If the plantation is to be a large one, it will be desirable to raise a stock of plants from seed, and then the question arises, how to obtain it? Shop seed of auriculas is, generally speaking, poor stuff; but there may be somewhere a trader who can and will part with a pinch worth sowing. As we are bound to give direct advice, we counsel the amateur to purchase a few of the

named varieties of every class—selfs, white, grey, and green-edged, and alpines. Grow these in frames the first season, and save as much seed as possible. Sow the seeds in pans filled with fine sandy loam, and keep them in frames always moist, until the plants appear, bearing in mind that you will have to wait for them a considerable time. When the seedling plants are as large as a bean, carefully transplant them into pans or boxes, or into a bed in a frame, always giving plenty of air, the use of the frame being advisable, because insuring the plants more attention than they might obtain if planted out in the open border in a very small state. When the stock has increased sufficiently, plant out old and young in the border, in the month of August, a foot apart, and leave them to take care of themselves, remembering that the auricula is one of the hardiest plants known, that drought is death to it, that damp in winter is only a little less injurious. From the time the first blooms of the seedling plants appear, a severe selection must be made. Instantly, upon a bad flower opening, pull out the plant and destroy it. By persevering in this course, and saving and sowing seed every year, you will secure a fine “strain” of border auriculas, and if you can keep a border of about 150 feet length well filled with them, as we have done for many years, you will be able to prove, in the flowering season, that the auricula is one of the loveliest border flowers we possess. To perpetuate named varieties, divide the roots in July or August.

BEST FORTY-EIGHT AURICULAS.

Green Edge : *Booth's Freedom, Leigh's Colonel Taylor, Dickson's Duke of Wellington, Page's Champion, Hudson's Apollo, Oliver's Lovely Ann, Smith's Lyeurgus, Cheetham's Lancashire Hero.*

Grey Edge : *Headly's George Lightbody, Turner's Ensign, Chapman's Maria, Turner's Competitor, Turner's Colonel Champneys, Reid's Miss Giddings, Fletcher's Ne Plus Ultra, Lightbody's Sir John Moore, Headly's Stapleford Hero.*

White Edge : *Campbell's Robert Burns, Heap's Smiling Beauty, Taylor's Glory, Smith's Ne Plus Ultra, Lightbody's Countess of Dunmore, Wild's Bright Phœbas.*

Selfs : *Spalding's Blackbird, Turner's Cheerfulness, Martin's Eclipse, Smith's Formosa, Lightbody's Meteor Flag, Martin's Mrs. Sturrock, Spalding's Metropolitan, Spalding's Miss Brightly, Turner's Negro, Chapman's Squire Smith, Headly's Royal Purple, Headly's Lord Clyde.*

Alpines : *Black Prince, Brilliant Defiance, King of Crimson, Constellation, Jessie, John Lee, Landseer, Minnie, Novelty, Venus, Wonderful.*

ON WINTERING CARNATIONS AND PICOTEEES.

BY A SUBSCRIBER.



THE mode of wintering these beautiful flowers has been so often given to the public by the largest and best growers of the present day, that it may appear something like presumption in me to offer anything with a promise of being either new or interesting. But in compliance with the request of some of my brother novices, who witnessed the healthy appearance of my plants all through last winter, which was by far the most trying I have known since I have grown this goddess of flowers, I will, with your permission, lay before the readers of the FLORAL WORLD, as concisely as I can, my system of management. I will not say that my plan is the best, but it shall be what it professes to be—namely, a plain account of the treatment given to them throughout the winter. I ought here to say, that I am but a very small grower to many of your readers, as my stock for blooming never exceeds three hundred pair, but, of course, I winter double that number. The kind of frame, or rather pit, I use, is different to any I have seen, but at the same time very simple, and useful in the summer for other things when the carnations are in their summer quarters. My pits are fifteen feet long by four wide; I build three rows of single brick piers, five feet apart in the rows, the two outside rows are two feet high, the middle one two feet four and a half inches, or one brick higher than the outside ones. On these I lay a plank, three inches thick by six inches wide, the long way of the pier. I then get some common house slate, and place one on the outside plank, the other on the centre one, and nail each end of the slate to the planks, to prevent it slipping, taking care to place the slates about one inch apart, to admit a thorough circulation of air to the roots of the plants; by having the centre higher than the outsides it forms a slope, and prevents the water from lodging in any part of the pit. I then make a frame-work of board one inch and a half thick, and one foot four inches deep; this is placed on the wall plates which form the pit. I put in my drainage six inches thick all along the pit; what I use is four inches of coarse coke, and two inches of ashes on the top. I then put in my soil, and fill up even with the frame-work. I have a span-roof frame for the top, with three glazed lights on each side, hung from the top with hinges, so that the lights from one side will turn over the ridge and fall flat on the other; the lights are six inches wider than the pit, so that the rain is thrown clear from the pit. I leave a space of five inches between the frame-work of the pit and the frame of the roof, which gives a thorough ventilation of air to the plants, and by having the lights six inches wider than the pit, it prevents the rain blowing in on the plants. My pits run north and south; on the east side and north end of the pit I have a board with hinges screwed to the pit to shut up in case of very cold cutting winds from the north-east. The south and west sides do not require it, as I don't think we ever

have winds cold enough to affect the plants from that quarter. I only shut up the east side and north, when the wind is very cold. The lights are open every day when fine on both sides. This then is the kind of pit I use, which I consider is far better than any other kind of pit or frame used, as you are not only able to keep up a thorough circulation of air to the plants in all weathers, but it admits air at the same time to the roots, which I think very essential to the health of the plants in the winter time. I think I can say almost more than any other carnation grower can, that is, I lost but one plant out of five hundred pair all through the trying weather of last winter. The grand thing I believe in wintering carnations, is giving them all the air you can, and keeping them as hardy as possible, which this kind of frame enables you to do, instead of having them stewed up in the cold kind of frames that are generally used. The soil I fill my pit with, is one-third compost, one-third road scrapings, and one-third sweepings of the gravel walks, well mixed up beforehand. I put in the soil about a fortnight before I take up the layers, to give the soil time to set; I then take up my layers and plant them in the soil, instead of potting them, which not only saves expense of pots and time, but I find the plants more healthy and not so liable to mildew. Before planting, I prune each plant to a clear stem, removing every pair of leaves and all the lateral buds and shoots, until the foliage will stand quite clear of the soil in the pit, about half an inch above it. I ought to have mentioned, that about the middle of September, when my layers are rooted, I cut them off at the corresponding half of the joint to that from which the young roots proceed; about the second week in October, I take them up, when I find most of them rooted from that part also. I at once plant them in rows in the pit, about five inches apart each way, planting them quite firm in the soil; when done, I close the lights and the space between the pit and frame, and keep them close for a week without water. Then I give them a good soaking and a little air, shading for a few days if the weather is bright and sunny.

The kind of pit I have described answers two purposes, that of wintering the carnation and also blooming other low plants under in the summer.

Others may find a greater convenience in a variation; that of course has nothing to do with the plan which I hold to be the best for wintering the carnation.

All I would impress on carnation growers, may be thus summed up: Place your plants under a glazed roof perfectly open on all sides, and a proper height from the ground, attend to watering, and in very severe cutting winds or in drifts of snow or sleet, enclose the sides for a short time as before described, and I feel convinced that any cultivator will be fully compensated for the trouble or expense he may have been at.

FERNS AND FERNERIES.



THE fernery belongs to the truly rustic rather than the rural department of gardening. Though ferns are beautiful anywhere, and may suitably adorn the trim border, and mingle with ornaments of formal design, they are more at home, more befitting, among tree-stumps, and in boldly designed rock-work or water scenery, where they appear in their proper character of wildness and simplicity. For the sake of convenience, we may now consider the fernery as a special contrivance—a garden in itself; and usually it is so, being in some way or other separated from other scenes. The requisites of an open-air fernery are ample space, variety of sunshine and shadow, plenty of moisture, alternations of slopes, hollows, and acclivities of surface, and good shelter from high winds and frosts.

In smoky town localities, it is difficult to establish ferns in the open air, owing to their delicacy of constitution, and impatience of a dry or smoky air. But in the suburbs of London, any of the ferns that are ordinarily grown in the open air will succeed, as we know by experience, and could name some very flourishing fern gardens at distances varying from two and a half to six miles from St. Paul's. In Mr. Hibberd's garden at Stoke Newington, all the hardy ferns, including even such peculiar things as the mountain parsley fern and the fountain asplenium, thrive in a most satisfactory manner.

Ferns artificially grown, and tended with proper care and skill, frequently exceed much in beauty those grown by nature. True, we cannot always secure the scene as well as the ferns—we cannot have the dark glen, the dank moss-grown cave, the decayed tree trunk, or the crumbling archway of the waterfall. The scenes amid which ferns grow, the lovely secluded spots which they seek out—shy wood-sprites that they are—are the chief charms of the associations they always suggest to us; for they do haunt the greenest and coolest nooks, the most mossy and ancient banks above water-brooks that trickle from unseen founts, in the deep recesses of wild rocky caverns, and under the branching arms of twisted grey-beard oaks and ancestral beeches—spots only discovered by the explorer of woodbine coverts and deep-hidden shades, where, searching for rare beauty, he finds it far excelling his anticipation, and checking his silent footsteps by sights that hold him breathless with surprise. Yet if we cannot have the mountain dells, and creeping thorns, and purple knolls of wild thyme, we may have the emblems of them in our mural paradise; we may have the ferns to suggest such things, and to keep alive remembrances of pleasures and of scenes that made a coolness in the brain and a freshness in the heart—breathings of fragrance from the green world that sweeten the resting-places in the march of life.

It is not requisite to the success of an out-door fernery that it should be fantastic or complicated in design, but if anything like a collection is to be made, many varied positions and aspects must be

provided to suit the various requirements of the plants. There may be a shady dell shadowed with a few large trees, where a fernery would be acceptable for its beauty and interest, and render a summer-house or rustic seat a more agreeable resort than it would be without a fernery. The capabilities of the district must determine the nature of the material to be employed. In the suburbs of towns "burrs" from the brick-kiln are usually the best material available, and answer admirably. If the soil of the place is suitable, the expense of carting in peat is saved; but if it is mere clay or loam, it will nevertheless serve for the foundation, for the strong-growing ferns, such as the common lastrea and the brake, will root down vigorously into it, if assisted in the first instance by planting them in a good fern-mixture. Although the subject admits of almost endless variety of treatment, we will suppose a case in order to sketch out a mode of procedure, which may furnish the key for the formation of a fernery altogether different to the suppositious one that for a few moments will now engage our attention. There is then a quiet spot shaded by trees on the far side of the lawn, quite shut out from the flower garden by belts of shrub and a silvery stream. We shall dig out a broad and irregular trench and throw up the earth to form banks and knolls. These we shall face with stone or burrs to form a picturesque scene, and provide for it a few distinctive features, such as groups of tree butts, an arch of thorn, or a pile of rock; the interstices communicate with a great body of sandy peat which is to be clothed with rock-loving ferns. Or we may on a hill commanding a view of the whole, construct a ruin, taking care to enclose in the walls an abundant bed of soil, so that ferns planted in the chinks and hollows will have a good chance of prospering. The very smallest thing possible for a feature would be an open central space, enclosed with a few trees of an airy, graceful character, to avoid interruption of the view, and therein a quiet summer-house with a pile of rock at the entry, and a few grand specimen ferns perched on blocks of wood—a pleasant lover's retreat, or if we must ignore romance, a cool grot for a friend and a cigar.

The banks and knolls should have a coating of sandy peat varying in depth from six inches to two feet, and here and there some of the burrs should be taken out, the natural soil below them removed to the depth of a foot or so, and the place filled up with peat. The ferns must be planted in positions suitable to the several kinds. In the lower and damper spots the lady-fern, the hart's-tongue, the osmunda, and the brake will thrive. On the more Alpine spots many of the smaller ferns will prosper. On the slopes, and indeed everywhere, the common lastrea will take kindly to almost any kind of soil. There are many fine plants that associate with ferns admirably, and we have no idea of restricting the cultivator's range of choice to ferns only. The equisetums are most elegant in their outlines and colours, and well adapted for damp and shady situations. The hardy bamboos, and a number of fine grasses, not the least important of them being the pampas and the arundo, harmonize with the scene admirably. Bits of colour are not only admissible

but desirable; the noble foxglove, which never shows its beauty better than in rustic scenes, and the pretty trailing tormentil, with the violet and the primrose, have a perfect right to shine amidst the herbage and pave the slopes with flowers. But the walk through, what shall we do with it? Now here is just the place in which to grow the beautiful spargula, and wanting that, if the hollow walk is formed of peat, say only six inches deep, it may be planted with that very common weed, the pearl-wort (*Sagina procumbens*). The ground ought to be carpeted, and we have for choice spargula, and sagina, tormentil, prunella, wild thyme, and a hundred more good things that bear trampling on without harm. Why not mix them all together—better such a carpet than a gravel-walk. Nor is the wild wood ivy unfit to share the praise that beauty brings in such a scene. Let it run over the great tree-stumps, and here and there climb to the top of a bank. The strong-growing ferns will rise up through it like gigantic shuttlecocks of emerald green, upon a lovely ground-work of dark glossy verdure. Let the rustic tone prevail throughout: have no roses, or geraniums, or vases, or artistic fountains. A stream of water, a tumble-down fountain, a rockery, a clump of birch trees, a cave with water trickling through and ferns clothing the sides and roof—these are appropriate accessories, and “bespeak the hand of taste.”

As to conditions of success. Some ferns will grow in the most commonplace soil, such as we might find in a good kitchen garden; but no progress will be made in the proper sense of the word without plenty of heath-mould or peat, or if that is not to be obtained, good leaf-mould thoroughly rotted, or wanting that a mixture of chopped moss, cocoa-nut fibre refuse, and sharp sand. A great many of the most interesting ferns love sandstone and sand, and cannot be grown properly without these materials. Ferns that love peat, such as the beautiful blechnum, and the lady-fern, will also grow luxuriantly in rotten wood; hence where tree-butts are employed, as in what we call a “rootery,” these free-growing kinds usually attain to a high degree of development. But a caution here. Dead roots and all kinds of decaying wood are apt to produce fungi in visible forms not always desirable, and in invisible forms that are poisonous to the roots of every tree with which they come in contact. *Experimentum crucis*. Bury a few old roots of trees amongst your standard roses. They will soon produce masses of white threads (mycelium), which will ramify and in time take hold of the roots of the roses, and the roses will then begin to decline in vigour, and will probably die if not relieved of the enemy. Every kind of tree is liable to injury from this cause; therefore in all cases where rooteries are found, the prudent artist will consider if the mycelium which is likely to be produced is likely to be productive of mischief.

A very simple, but decidedly picturesque mode of growing ferns in a collection by themselves, occurred to us a few years since through an accidental circumstance. We had, in a yard adjoining the garden, a large stock of faggots, tree loppings, bean-sticks, roots, and other forest refuse, and amongst them a number of old unbarked

blocks, on which some fine ferns were rooted and flourishing. Setting to work one day to put the stack in order, and having a number of ferns for which there was no room in the garden, we placed several dead trees of large girth to form the outlines of a large space. Within this the roots were packed with no particular order, and at the back a mass of rotten wood and moss, which had been collected for cultural purposes. The whole was roofed with loppings and bean-sticks, so as to construct a sort of extemporaneous hermit's cell, or grotto of wood, into which no perpendicular light could fall, but the light entered freely at three of the sides. Here among the roots, on the ground, and on the bank of rubbish at the back, ferns were planted. Sufficient rain gained entrance through the interstices of the roof, the ferns flourished, and a number of pretty wildings, including ivies and brambles, sprung up amongst the moss and peat used in planting, and in this way we came into the possession of one of the prettiest ferneries imaginable, though it was in a position quite unsuited to it, and at a distance had no more romance about it than belongs to any stack of faggots in a farmer's yard.

The space within measured about thirty feet by twenty, and was about seven feet high, the roof resting on rough props and the stems of dead pollard alders. Its appearance inside was beautiful; groups of brake and male ferns towered up among the dead branches, patches of holly fern and polypody covered the dark blocks and ungainly roots, the *osmunda* spread out its leafy fronds beyond the boundary of timber to the open air, and all over the ground where smaller ferns had even been thrown in and forgotten, new fronds broke out and covered the dusty floor with woolly croziers and bright green shepherd's crooks so completely and luxuriantly, that ever since we have regarded such a plan as just the one required for an out-door fernery. If the thing is to be done again, it may be better done. Instead of throwing the materials together pell-mell, select a number of unbarked pollards, some large knotted loppings of old plum, or apple, or oak trees. With these construct a frame-work, setting the supports at the corners, and making a very light roof of rough trellis. Then plant it round with fast-growing climbers, some of which should run up light posts midway between the corner pillars; and construct green walks, with plenty of open spaces for the admission of full daylight, as also for the entrance and exit of the cultivator and his visitors. The roof should also be covered, and indeed to a great extent formed with greenery, and the knife and shears employed to keep the trailers within bounds, so that they may not obstruct either daylight or rain, but effectually screen off the mid-day summer sun.

Then inside build a bank of fern compost, with a bottom of brick rubbish; in one corner, where light comes in plentifully, make a hollow, and puddle it with clay, and then spread in it a foot of peat for some of the marsh ferns, and others that like moisture at their roots. A little rock-work, formed of dark stones, or the burrs from a brick-kiln, would round off the corners and slopes of the bank; and about the ground place a few huge tree roots, also to be

planted with suitable ferns. In such a space you may find room and proper positions for every one of our native ferns, except such few as it is not possible to cultivate out of doors. There would be a fernery and bower combined, green and cool, and dark at all times, a charming place in summer, and not quite a desolation in winter; for with the shelter afforded, especially if the side towards the east were made pretty close with rustic trellis, the majority of the plants would carry their fronds through the winter; and by draining off superfluous water a warm air would prevail within that would be just sufficient to bring them on in early spring, without weakening them so much in autumn as to risk their winter existence.

The shedding of the foliage of the trailing plants outside would give freer access to the light in winter, and the strong light of summer would be shaded off by the thickening of the foliage then; but if at that bright season too deep a gloom prevailed, it would be the fault of the pruning-knife, not of the scheme itself. It would cost next to nothing, for if you were tired of fern-growing—and the attentions requisite would in this case be reduced to a minimum—you might pull down the structure, and get back the cost of the timber by turning it into firewood; and as the ferns and other plants would increase considerably, the nursery stock would be worth more than it was at starting, so that a fernery of this description is cheap enough for the humblest lover of the beautiful, and choice enough for the most wealthy connoisseur of taste in gardening.

A SELECTION OF ONE HUNDRED SPECIES AND VARIETIES OF HARDY FERNS.

The undermentioned selection includes only the most beautiful hardy ferns at present in cultivation, and those only are named which will grow on an ordinary rockery without any special treatment.

BRITISH.—*Adiantum nigrum*, *Asplenium lanceolatum*, *A. trichomanes cristatum*, *A. t. lobatum*, *Athyrium filix-femina*, *A. f.f. compositum*, *A. f.f. conoides*, *A. f.f. corymbiferum*, *A. f.f. diffissum*, *A. f.f. diffisso-multifidum*, *A. f.f. Elworthi*, *A. f.f. Fieldiæ*, *A. f.f. Frizelliæ*, *A. f.f. frondosum*, *A. f.f. gracile*, *A. f.f. grandiceps*, *A. f.f. Grantiæ*, *A. f.f. laciniatum majus*, *A. f.f. multifidum*, *A. f.f. plumosum*, *Blechnum spicatum multifurcatum*, *B. spicant ramosum*, *Ceterach officinarum crenatum*, *Cystopteris fragilis*, *C. fragilis Dickeana*, *C. montana*, *Lastrea æmula*, *L. cristata spinulosa*, *L. dilitata angustipinnula*, *L. dilitata collina*, *L. dilitata grandidens*, *L. filix-mas*, *L. f.m. Bollandiæ*, *L. f.m. cristata*, *L. f.m. angustata*, *L. f.m. furcans*, *L. f.m. grandiceps*, *L. f.m. paleacea*, *L. montana crispa*, *Osmunda regalis*, *O. regalis cristata*, *Polypodium alpestre*, *P. alpestre flexile*, *P. dryopteris* (Oak fern), *P. phegopteris* (Beech fern), *P. vulgare*, *P. vulgare cambricum*, *P. vulgare cristatum*, *P. vulgare omnilacerum*, *P. vulgare semilacerum*, *Polystichum aculeatum*, *P. aculeatum lobatum*, *P. angulare acutilobum*, *P. angulare brachiatum*, *P. angulare concinnum*, *P. angulare cristatum*, *P. angulare grandiceps*, *P. angulare grandidens*, *P. angulare latipes*, *P.*

angulare oxyphyllum, *P. angulare plumosum*, *P. angulare proliferum*, *P. proliferum Wollastoni*, *P. angulare tripinnatum*, *Pteris aquilina*, *Scolopendrium vulgare*, *S. vulgare bimarginato-multifidum*, *S. vulgare contractum*, *S. vulgare cornutum*, *S. vulgare crispum*, *S. vulgare crispum majus*, *S. vulgare curiosum*, *S. vulgare digitatum*, *S. vulgare laceratum*, *S. vulgare macrosorum*, *S. vulgare multifidum*, *S. vulgare ramo-marginatum*, *S. vulgare ramosum majus*, *S. vulgare submarginatum*.

HARDY EXOTIC.—*Adiantum pedatum*, *Athyrium asplenioides*, *A. asplenioides purpureum*, *A. tenuifrons*, *Crytomium falcatum*, *Cystopteris bulbiferum*, *Lastrea intermedia*, *L. marginalis*, *L. chilensis*, *Osmunda cinnamomea*, *O. Claytonia*, *O. regalis purpurescens*, *Polystichum Brauni*, *Pteris aquilina Americana*, *Struthiopteris Germanica*, *S. Pennsylvanica*, *Woodwardia areolata*, *W. Virginica*.

A few clumps of the "Horse-tails" planted amongst ferns produce a pleasing variety, and of these *Equisetum arvense*, *E. Mackai*, *E. Moorei*, *E. salvaticum*, and *E. variegatum Willsoni*, are the most beautiful and distinct.

For carpeting the surface, and trailing over the mounds, ivies are invaluable; the most suitable are *Hedera helix*, *H. h. heterophylla*, *H. h. lucida*, *H. h. nigra*, *H. h. pedata*, *H. h. marginata grandis*, *H. grandifolia*, *H. g. viridis*, *H. g. maculata*. A few tufts of the variegated forms of *Vinca major* and *V. minor*, intermixed with the ferns, will add much to the beauty of the scene.

PROTECTION OF HALF-HARDY PLANTS IN WINTER.



HERE can be no doubt that the list of plants capable of out-door culture throughout the year might be greatly extended, provided a proper system of protection were employed; and that many plants which are now rarely seen in any but a restricted form, would, under such treatment, attain a luxuriance rivalling that exhibited by them in their native haunts.

Among many others, the *Tropæolum tricolorum*, or Tricolored Indian Cress, occurs to us; this plant is, we believe, never, or at least very rarely, seen cultivated except in pots, in which we admit, however, it makes, when well grown, an exceedingly ornamental appearance; but when planted out against a wall, and the tuber protected in winter, the difference in the size attained is scarcely credible. It is true these results are not attainable without a little care; but the splendid display made by this and many other exotics during their flowering season, is a rich reward for the pains bestowed. For the greater convenience of treatment, plants which it may be desired to protect may be classified in three or four groups: 1st, Wall plants; 2nd, Shrubs, or half-shrubby plants; 3rd, Herbaceous plants; 4th, Bulbs. The first division includes a large number of beautiful subjects such as the *Habrothamnus fasci-*

culatus, *Tacsonias*, *Sollyas*, *Mandevilla*, *Myrtle*, and *Clianthus puniceus*.

In protecting these, and indeed all other plants, it must be borne in mind that, in many cases, it is not so much a low temperature that is to be dreaded, as its association with sodden soil and unripened tissues; could these last conditions be guarded against, the protection of many plants would be comparatively an easy task; our endeavours must, therefore, be directed to preserving the soil around their roots in as dry a condition as possible.

The *Tacsonia manicata*, appears likely to fulfil our anticipations of its comparative hardiness. A specimen of ours, planted against a wall, has covered a considerable space. We intend to place over its roots a semicircle of wood, eighteen inches wide, and an inch thick, the straight edge of the board to be placed against the wall, and a small notch cut out for the stem of the plant. The board will be raised above the soil, by two or three cube-like feet, and the space between it and the ground stuffed with some dry materials, hay or fern. The stems themselves will be left exposed as long as the weather is mild; on the first approach of frost they will be cut down to within four or five feet from the ground, and the whole be gathered into a bundle, around which will be wrapped one or two thicknesses of bast matting; this, however, being so liable to become soaked by heavy rains, in which state it would be worse than useless, will be covered with a piece of waterproof calico, or oil cloth, the top or end of the bundle being also tied over with this material. Thus, the bast will act as a non-conducting medium, and the waterproof calico will preserve the whole in a dry state. With these precautions we fully believe that the *Tacsonia* will take no harm, even with the thermometer as low as 18° or 20° Fahr.; such of the surface roots as extend beyond the wooden semicircle may perhaps be killed, but the plant itself will not suffer. The *Mandevilla* may be treated in a similar way, and all other deciduous climbers requiring protection.

The *Habrothamnus* will need little more than the covering of the roots we have recommended for the *Tacsonia*; on a west wall, where its shoots will receive but little excitement from the sun's rays, this beautiful shrub will bear some degree of frost uninjured without any protection, especially in dry soils; some provision should be made, however, for covering it in severe weather, as the flowers are produced at the ends of the branches, and these are precisely the portions of the plant which would first suffer. We know of no better plan of affording this temporary shelter than by placing in front of the plant a frame covered with matting, or old carpeting, and sufficiently large to extend some inches beyond the plant on all sides.

Such a frame may be made in any style, and with any materials, from smooth deal splines put together, *secundem artem*, to rough poles cut from a coppice, and tied at the corners with a strong cord.

These last may be made to answer every purpose, and need not be more than one inch in diameter, except for large frames. The size of the frame will, of course, vary with that of the plant to be sheltered; it will be a good plan to prepare several of them differing

in dimensions. One of five or six feet in height, and the same in breadth, will be found very useful, and if made of light poles, will not be too heavy for even a lady to remove.

The covering for the frame may be made of bast matting, old carpet, floor cloth, tarred canvas, or, in short, any fabric capable of being securely fastened. The tarred canvas will be found an excellent material, on account of its waterproof qualities, and strips of floor-cloth are equally useful; but these will need nailing to the frame, and should overlap each other. When placed before the plant, the frame will, of course, be arranged in a slanting position; and, if necessary, may be secured by a short hooked stake driven into the ground at the foot and at the top by a staple and cord. It will be understood that these frames are only to be employed when frost threatens; in mild, open weather their use would be injurious to most of the shrubs, and likely to cause a premature growth, which must be carefully guarded against, as much of the success in preserving the more delicate of this class of plants during winter, depends on their energies being kept quite dormant. It is for this reason, that when the shoots are well ripened, they often suffer less in mid-winter than in early spring, when they commence their growth.

We have referred only to the *Tacsonia Habrothamnus*, but our suggestions are equally applicable to other wall-plants of a tender character.

Armed with a few of the portable frames, the amateur horticulturist will be able to preserve many greenhouse plants, usually supposed to be too tender to endure our winters, such as the splendid *Clianthus*, the *Pittosporums*, the *Acacias*, *Photinias*, *Camellias*, *Magnolias*, *Myrtles*, and many others.

TENDER SHRUBS AND HALF-SHRUBBY PLANTS.—The protection of this class of subjects involves, perhaps, a little more care than the preceding, but the same principles must be kept in view. A great point will be gained if the roots of shrubs can be screened from the heavy rains so characteristic of our autumnal seasons; and this can be accomplished without difficulty, by applying two of the wooden semicircles, referred to in the previous page, around the base of the stem, so as to form a complete disc. In many cases, such a protection applied early, would so materially check the production of young wood, and assist the ripening of the shoots, that it would alone be sufficient to prevent injury by subsequent frosts. There are a few plants, however, which need a covering of some description, and of this number is the tree *Pæony* (*Moutan*). This splendid plant, our readers are aware, does not die annually, but possesses a shrubby habit, and, like the herbaceous kinds, commences its growth in early spring, whilst frost is yet rife. It is at this period that protection is chiefly required; and it may be afforded by driving a few upright stakes around the plant, and arching over these two stout osiers, placed cross-wise, their ends being secured to the stakes by tarred strings. Over the top a piece of waterproof material can be thrown at night, and secured with string to the stake. The same kind of covering may be used for all tender evergreens of large sizes,

such as the *Rhododendron arboreum*, and the other species that are likely to suffer from full exposure. It is not only during actual frost that this protection will be needed, but also whenever the cutting east winds are prevalent. In the latter case, it is often advisable to protect with the canvas only that side of the shrub next the wind, the other being left open. Some of the *Cistus* family are liable to perish in water if the soil is wet, or the situation is very exposed, and to these beautiful shrubs the kind of covering here suggested is very suitable. In dry soils a few branches of fir, laurel, or other common evergreens, will often be found a sufficient protection for many dwarf shrubs and half-shrubby plants. Where it may be occasionally necessary to completely cover half-hardy plants of moderate size, such as the *Cantua dependens* and *Mitraria coccinea*, a cylinder, formed of two or three hoops connected by a few upright roots, and covered with tarred canvas, will be found of great service.

If preferred, the skeleton of the frame might be constructed of galvanized or painted iron wire, which would last many years, if strongly made. A top to the cylinder will be essential, and this being separate, will allow of air being admitted in mild weather without disturbing the entire protector. If additional warmth is required—and for the two plants we have named it will be desirable—the cylinder may be covered with a piece of matting, before attaching the outer canvas; this last should invariably be tarred or painted, or it will soon rot; in its stead oil-cloth may be used, but the canvas is considerably the cheapest.

The cost of such cylinders as we have described, three feet high and eighteen inches in diameter, need not exceed sixpence each; and they may be constructed by any person possessing the smallest modicum of mechanical genius, and in any locality where a few stout osiers, a bit of canvas, and a little tar are attainable.

HERBACEOUS AND BULBOUS PLANTS.—Practically, these two divisions may be classed together, and their protection is very simple. In most cases, an eight-inch pot filled with hay will be a sufficient protection for such roots as the *Salvia patens*, *Cuphea strigillosa*, *Anomatheca cruenta*, and nearly all the Cape bulbs.

It is usual to employ in these cases a mulching of half-rotten manure, but this is, in our opinion, very objectionable, as it soon becomes saturated with moisture, which it retains for a long period. Leaves are open to the same objection unless they can be kept dry, which may be done by placing a slate or tile over them: this will not only keep the leaves in their places, but afford in itself additional protection. Small heaps of coal-ashes are sometimes placed over tender roots, and if screened from wet by covering them with a large pot, these are very efficient protectors. We have seen saw-dust used for the same purpose; but no worse substance could be employed, unless it is kept dry by covering; when exposed to wet, it loses entirely its protective character. For bulbs or plants requiring only slight protection, a furzey branch or two, pegged down, is one of the best and simplest coverings; and this material will be found exceedingly useful for beds of half-hardy bulbs, as well as for placing between patches of autumn-sown annuals in

severe weather. It is, however, very important to observe that in the case of bulbs or roots which commence their growth early in the spring, the coverings should be partially removed, and their place supplied with an empty pot.

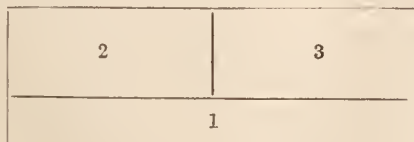
We have by no means exhausted the subject, but sufficient has been said to guide our readers to successful results. It must be borne in mind that a sudden increase of temperature must be as carefully guarded against as severe frosts, especially in the case of wall plants, which are often exposed in early spring to the alternate influences of bright sunshine by day, and sharp frosts by night; the injurious effect of these sudden changes must be prevented by keeping the screens entirely before the plants during the prevalence of such weather, and removing it only in dull days. In all cases, protective coverings should be cautiously withdrawn on the approach of spring, and never entirely dispensed with at night, in the case of delicate plants, until the end of April, when they may be placed aside in their summer quarters until again,

"Autumn's yellow lustre gilds the scene."

FORCING SEA-KALE IN FRAMES.



FORCING sea-kale in frames can be accomplished in a variety of ways, but the plant is so manageable that convenience is a matter for first consideration. For an early supply the following plan may be recommended: Make up a bed for a small two-light frame, using tree leaves with a little fermented manure just to form the outsides, to bring the bed into shape. For small families, New Year's Day will be quite soon enough to commence. The leaves, etc., are well beaten with a fork as the work of making up is going on. A height of four feet at back, and three and a-half feet in front, will give out sufficient heat for the purpose, as not more than a bottom-heat of 60° is wanted; indeed, anything above 60° will induce a weak growth. This bed may be made in any out-of-the-way corner of the garden or frame-ground, and after it has been made a few days, put in about six inches of leaf-soil. This will keep down the steam, and will serve to plant the roots in. A convenient size for a frame is eight feet by four, and it should be divided into three parts, as in the accompanying plan:—



No. 1 compartment is planted first, and as six inches of soil will not admit of the roots being planted down, they may be laid in a

January.

little on the slant, so as to have the soil up just under the crown, and these ought to be three inches from each other, and gently watered with tepid water after the planting is finished. The frame should then be covered up, first with a mat, and over that a layer of short hay two inches thick, with another mat at top. This will effectually exclude all light, and if the heat is what it ought to be, some well-grown kale will be fit for table in about six weeks. Nos. 2 and 3 compartments are filled at an interval of about a fortnight, so that there are always plants in three different stages of growth; and in this manner, by filling up with fresh plants every time a part is all cut, a succession may be kept up either till the plants are exhausted, or the season over.

But this cannot be done with the heat of the bed alone, for in the course of two months this will be exhausted, and linings will be required. This is done by simply putting a good thick layer of fresh stable manure round that part of the frame which has been last planted. This will want turning and well shaking up about every ten days, to renew the heat. It appears necessary to add that a very little air should be given every other day for about a couple of hours, to let out any steam that may arise from the heat of the bed. This will insure a sweet and pure atmosphere, which, if not attended to, might perhaps be detrimental to the flavour of the produce; but, on all occasions, or on whatever plan of forcing is adopted, it is important to remember that the admission of light or air for any length of time will discolour the growth, which must be avoided.

For very small gardens the following plan will be found serviceable and convenient:—Procure a good box, about four feet wide, and as much in depth. Take this to a warm, close cellar, and put in it six inches of moderately light dry soil. In this soil place the crowns, and give them a gentle watering, and in the course of six or seven weeks, if the place is a moderately warm one, some good kale may be expected.

FORCING ASPARAGUS.



THE simplest way to force asparagus is by bringing the heat to them, for then the roots are undisturbed, and will gain in time and size. For this practice the beds should be four feet wide, with two feet alleys between, and the beds selected for forcing should be left uncut in the *preceding* summer, that they may accumulate the strength needed to enable them to endure the trial. The first business is to determine when the first cutting is required, and the later it is wanted the better for the plants and the gardener. If you wish to cut in January, you must commence operations six weeks in advance; if in February, five weeks in advance; if early in March, four weeks in advance. The forcing consists in covering the bed with litter, and then taking a shallow spit from the alleys and throwing it equally over the litter. The alleys are then filled with hot dung, which must be raised to at least one foot above the level of the beds,

and when slightly trodden must be covered with boards to shut in the heat and keep out the cold and wet. Finally, the beds should be covered with six inches depth of the same hot dung. In a mild winter the routine may be modified with a view to economy; and, as the season advances, the amount of heating material required to start a bed will become less and less.

A better quality of forced asparagus, less fat, but green, and therefore tender, and with the welcome flavour of a good sample, may be obtained by taking up the plants and forcing them in pits and frames. It is a very simple business. The plants should be taken from beds three or four years old, and planted in light soil on well-made hotbeds, or beds heated by hot-water pipes. A gentle heat suffices, and indeed the slower the forcing the better the produce. As the glass protects the plant from frost, it may enjoy light and air, except when the weather is severe, and therefore need not be much moulded up, the object being to obtain short, plump, dark-green shoots of the most tender and richly-flavoured kind, fit to "set before a king." A large, deep bed of leaves, with a sufficiency of old lights and walls of turf, or loose bricks, or stout boards set on edge with pegs to hold them, afford machinery enough for the production of the finest forced asparagus, provided only there is a strong plantation of some years' standing to begin with for the supply of stools for the purpose.

PLANTS TOUCHED WITH FROST.



WHATEVER is touched with frost keep dark and cool, and damage will be lessened, if not entirely obviated. The effect of frost on plants depends considerably on the state it finds them in. Soft-wooded greenhouse plants are killed *instantly* if they are in a moist atmosphere and growing temperature with full enjoyment of light; but if moderately dry, and well covered so as to be almost in total darkness, very many even of the tenderest will bear a few degrees with impunity. This advice may be of use now, for we may have a smart time of it yet, before the cowslips blossom. If frost gets into a house, and makes its mark on the minimum thermometer, draw down the blind, if you have one, at once, or cover the lights with tarpaulin, straw, or whatever may be at hand to exclude the light, and be particularly careful not to get up the heat in a hurry. To raise the temperature is, of course, essential, but it will be well to keep it at about 33° for a day at least, that thawing may take place slowly. A few degrees of frost met in this way will do much less harm than is generally inflicted where the terrified cultivator heaps on the fuel, in the mistaken notion that fire is the proper antidote to freezing. The same remark holds good as to fruit. The frost gets into part of the store of apples and pears, and some are frozen hard. If they are allowed to thaw slowly, and *in the dark*, they are not a whit the worse for the visitation. If thawed in full daylight, they would probably melt in the operation.

A SELECTION OF TREES FOR WATER SCENES.



EARLY all large-growing hardy trees thrive in the neighbourhood of water, although it is not so stated in the books. But for positions commonly too moist for a large selection, willows, birches, alders, and elms are the most useful. Of willows the most ornamental are *Salix americana pendula*, *S. babylonica*, *S. caprea tricolor*, and the Kilmarnock willow. All the birches are beautiful, but the most choice are *Betula alba pendula*, *B. papyracea*, *B. nigra*, *B. rotundifolia*. Amongst the alders, the best are *Alnus glutinosa aurea*, *A. g. laciniata*, and *A. montana*. The common elm need not be named here, as it is well-known as one of the grandest of forest trees. But the Camperdown elm, *Ulmus campestris camperdown*, and the twiggy elm, *U. c. viminalis*, are less known than they deserve to be, considering their beauty. The common hydrangea attains to magnificent proportions in the neighbourhood of water.

NOTES FOR AMATEUR GARDENERS.



TO MAKE A HYACINTH BED.—Dig the ground at the end of September, and ridge it up for the atmosphere to sift through it freely. After a week or ten days, take out the soil to the depth of a foot, and lay down a stratum of *fresh* cow-dung four inches thick, or, wanting that, half rotted stable-dung, the shorter the better. When the dung is laid down, replace the soil, breaking it very fine, and mixing with it about an eighth part of gritty river-sand, or, if that is not obtainable, sea-sand may be used, but coarse yellow pit sand, which is so often used, is the worst thing that can come into the vicinity of a hyacinth. Those who question my advice as to *fresh* cow-dung—and it may startle some—are advised to try it *one* season with some bulbs on which they set little value; they will assuredly treat their choicest stock in the same way the year following, and this will come to be the orthodox way of manuring hyacinths. It is all they require to bloom superbly, and retain their strength for years; but it should be remembered that the dung should be eight inches from the surface, as it then attracts the roots downwards, gives the plant a stimulus just as it wants it—namely, when nearly flowering—obviates the need of frequent watering, by keeping a cool moist bottom, and affords the strength requisite to the production of strong offsets, and the forming of blooms for the next year. About the end of October is the time for planting. Plant *early*, and five inches *deep*.

TO PREVENT FOGGING OFF.—Cuttings in heat, and seedlings pricked out, are very liable to damp off, if in a confined air, with too much moisture. The best mode of treatment, is, as soon as evidences of damping appear, to give more air, and increase the temperature five degrees, and, at the same time, to sprinkle the surface of the soil with a mixture of silver-sand and powdered peat, crumbled to the fineness of snuff.

REMINDERS OF GARDEN WORK IN JANUARY.



EDGES should be cut and trimmed, and, if damaged, mended with new plants of the same kind, or by laying down some of the branches of the old; in doing this the branch should be cut half through, and bent down to fill the gap.

TULIPS should be as carefully kept from frost as possible, the soil they are in should not be even crusted on the top, if it can be avoided; if the earth be frozen down to the bulb, that bloom will assuredly be less perfect than if it were not frozen, however lightly the thing may have been treated in consequence of the known hardy nature of the bulb.

AURICULAS require no water while there is the least moisture in the compost they are growing in; they must be cleansed from dead leaves, and must not be allowed to be quite dry, but moisture must be sparingly given; they are also much better kept from freezing, not that they are tender, but they always bloom the worse for a decided check, and as the fibres or the root are next to the pot, they are reached easily.

CARNATIONS and PICOTTEES are generally wintered in pots; they are as impatient of wet and confinement as any hardy flower that blows; they suffer mildew from that cause alone, therefore they cannot have too much air or too little wet; the frames they are kept in should be impervious to rain, and the bottom should be so constructed that the wet they have in watering should run away, and not soak into the ground, for the damp which would arise from the soddened bottom is as fatal as wet upon their foliage. The bottom of the frame should be paved and cemented, and sufficiently sloping to let the wet run out at once. The glasses should be off every mild day, and be closed in frost and rain this month at any rate; those in beds take their chance.

PINK and HEARTSEASE in beds may be preserved, in case of hard frost, by covering with litter of any kind rather loosely, but not enough to deprive them of light and air.

HYACINTHS in beds or borders should be covered with hoops and mats or litter.

RANUNCULUSES and ANEMONES that were autumn planted, should also be protected from frost.

Plants in the greenhouse or in pits or frames should be carefully protected from frost and sparingly watered.

Sow early peas in rows a yard apart, the more sheltered the place the better.

Dig up vacant spaces when crops have come off, and plant out cabbage a foot apart, in rows eighteen inches from row to row.

Autumn sown beans for planting out should be protected, and some more of the early kinds should be sown for transplanting.

ASPARAGUS may be forced in a common hot-bed, and produced in a short time.

TO CORRESPONDENTS.

DENDROBIUM NOBILE.—*Old Subscriber, S. Molton.*—The cause of your failure to obtain flowers on these plants, is probably improper or insufficient attention during their season of growth, and we hope that the following system of cultivation may enable you to be successful in the future. The soil for these plants should be composed of one half fibrous peat, and the other portion made up of sphagnum and rotten wood; this mixture should be thoroughly incorporated without breaking it fine, and an efficient drainage must be secured, or the plants will not thrive; the base of their stems should be elevated two, three, or four inches according to the size of the plant, above the top of the pot or basket,

January.

as they are liable to much injury from damp when protruding their new shoots. The temperature of the house is a consideration of the first consequence to their successful culture; it requires to be assimilated, as nearly as circumstances will allow, to that of their native positions, and may be described as of three distinct phases: a dry and warm season, in which the plants produce their flowers; to be succeeded by one still warmer, and in which an abundance of moisture must be present, as it is at this time that new growths are effected; and this active season must be followed by one suited to produce a state of repose in the plants, by reducing the amount of heat considerably, and restricting the supply of moisture to the least possible quantity; this season is that which corresponds with our winters, and for convenience should be referred to that time. Thus from December to about the end of March, or later for some species, may be regarded as the period first mentioned, the growing season commencing with each individual as soon as its flowering is over, and continuing until the growth is complete, which is usually about the end of August or some part of September, when they require the perfect rest already spoken of. It is in the variations of these seasons, the withholding or appliance of stimuli, that the whole art of the management lies. If it is done correctly, and at the proper time, of course the plant progresses satisfactorily, but otherwise all is confusion; the plant continues growing, but does not flower, becoming weaker each season. An average temperature of 55°, with but slight alteration, should be observed for the dormant season; increasing it gradually to 65° or 70° for the flowering period, and after this is past the temperature may be allowed to run up to 85° or 90°, or even more through the summer, keeping a proportionate amount of moisture in the atmosphere of the house by means of frequent steaming, syringing, etc.

PASSIFLORA EDULIS.—*Hyacinth.*—This requires stove treatment. We should recommend you to try either *P. cerulea* or *P. racemosa purpurea* in your greenhouse.

YUCCA.—*F. J. H., Norwich.*—You must guard the centre from excessive wet, by tying the leaves together in an upright position. They should be grown in rich turfy loam and sand. The blossoms of all the species are greenish white and on established plants are produced annually.

CAMELLIAS IN THE OPEN GROUND.—*H. G., Bournemouth.*—Camellias may be grown without protection in the open ground. For this purpose a northern aspect should be selected, so that their season for flowering may be retarded as long as possible, as the flowers are liable to be injured by the frosts in spring.

ERICAS.—*Beginner.*—Whether the plants are grown in a house or pit, ample command must be had of the ventilation, as no plants receive so much injury from confined air as these; in fact, the only necessity for protection at all, is against frost and excessive wet. On all favourable occasions they should be opened to the atmosphere on all sides, a free circulation of which among them, prevents attacks of mildew, damp and other evils, by rendering the wood firm and mature; in winter it is far preferable to protect them from severe weather, if not of long continuance, by means of outward coverings than by fire-heat, which often tends to mischief, either exciting them to premature growth, or by drying the soil near the outside of the pots, and thus inflicting an injury to the roots; fire-heat should therefore be avoided as much as possible in the treatment of these plants, never applying it until it becomes impossible to preserve a proper temperature without it.

FICUS ELASTICA.—*E. D. E., Faversham.*—The cultivation of this elegant foliage plant is of the easiest description, merely to be potted in fibrous peat, and to have plenty of water during the growing season. If cultivated in a humid atmosphere, such as that of an orchidaceous house, it will emit roots from its stem and branches, and attach itself to any contiguous object, such as a wall, in the manner of an epiphyte.



AQUILEGIA CANADENSIS.

AQUILEGIA CANADENSIS.



THIS elegant but hardy perennial is, as its name implies, a native of Canada, where it usually grows about nine inches high; but in this country, however, it generally attains the same size as the common Columbine, which it greatly resembles in the appearance of its leaves, though it differs in having its flowers of a different form and colour. It may be easily propagated by dividing the roots either in the autumn or the spring; or it may be raised from seed, which it ripens in great abundance. In the latter case, however, the seeds should be sown as soon as they are ripe, as otherwise they will be a long time before they germinate. The very graceful, nodding, scarlet and orange flowers, which appear in April and May, are nearly two inches in length, and on each pedicel there are two bracts, so near the flower as to have almost the appearance of a distinct green calyx.

THE FLORAL DECORATION OF ROOMS, HALLS, AND PASSAGES.

BY JOHN R. MOLLISON.

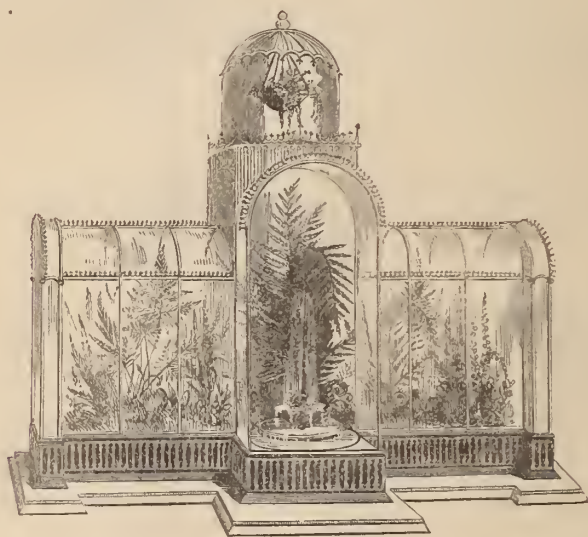


IN the floral decoration of our dwellings a great many ingenious contrivances have been brought into repute. In this paper I intend to notice a few of them, and describe their arrangement and practical usefulness.

The chief of all decorative inventions is the glazed plant case, or Wardian case. The case in various styles we have in our rooms, on our staircase landings, in our halls and passages, full of tender exotic ferns, hardy ferns, and flowering and fine foliage plants. The inventions next in importance are the hanging baskets, and wall brackets, earthenware and china vases, cut-flower glasses and screens. They are all used for hanging from the windows, on the walls, standing on stair-landings, in passages and vestibules.

Hanging baskets are very suitable for the cultivation of many plants having slender drooping habits of growth, such as the *Convolvulus mauritanicus*, *C. tricolor*, common Ivy, *Linaria* or toad-flax, *Creeping Jenny*, ivy-leaved *Geraniums*, *Lobelias*, *Saxifrages*, *Tradescantia zebrina*, and *Selaginella*; and all ferns, foliage plants, and cut flowers. They can be obtained of various sizes and materials. Those made of galvanized wire are best, for rust is not so liable to disfigure them as when they are only painted, and they are also light in appearance. Baskets made of earthenware are very good, but always heavy-looking. Very pretty rustic hanging baskets are made from wood and virgin cork. Hanging baskets, with zinc boxes fitted inside, having a false bottom and tap to collect superfluous water, are preferable for indoor decoration. For baskets on

the balcony this arrangement is scarcely necessary. They may be of any size for indoors, but for balconies outside they should always be large and roomy. Very pretty hanging baskets can be made of knots, gnarled tree roots, or pine cones nailed over a small wooden box and varnished. Materials for this style of basket are easily got in the country, and they can be purchased ready-made in the towns. An extremely pretty hanging plant stand may be made by drilling holes in the corners of an encaustic tile, and fixing wires or small chains, or even twine, through the holes, and meeting above, with a hook to suspend it from a nail in the centre of the window recess. On this little stand, a plant of *linaria*, *convolvulus*, or Aaron's beard, can be placed, which will droop down with the prettiest fragile green wreath imaginable. I have a golden variegated variety



ORNAMENTAL PLANT CASE WITH FOUNTAIN AND HANGING BASKET.

of the *linaria* which is quite a gem for pots or hanging baskets. A very pretty little table ornament can also be made with three sticks of equal length, joined to form a tripod, and covered with tinfoil. A small basket, covered with the same material and suspended from the centre, could have a pot of *selaginella*, toad-flax, Aaron's beard, or small fern, placed within it. This is an extremely elegant device, having the appearance of a real silver tripod.

Brackets of various designs are greatly used in room decoration, to cover bare walls near windows, and in draping picture-frames and mirrors. They are made of earthenware, wood, wire, virgin cork, and zinc. When you wish to drape a picture-frame or mirror, the zinc brackets should be used and hung at the back of the frame to be concealed from view; in them the common ivy grows well,

and can be trained in any form you wish. A very simple contrivance is a copper wire twisted to form a ring at one end large enough to hold the pot just below the rim, with a loop at the other end for hanging it on a nail.

Vases, trumpet glasses, and stands, in terra-cotta, china, and glass, of numerous designs, are extensively used for the decoration of dinner-tables, rooms, halls, stair-landings, and passages. When used in the decoration of halls or vestibules, cut-flower vases should be larger in size and different in shape from those used in the decoration of rooms or dinner-tables; many flowers that would have too clumsy an appearance in a drawing-room vase will suit a vestibule vase to perfection, for a bolder arrangement of details must be aimed at with them to have a good effect.

Of the many varieties of stands for cut flowers in use, there are four that do not intercept the view, are easy to fit up, and not expensive to purchase. They are as follows:—The true Marchian; the Marchian, with trumpet and top tazza; a high, slender trumpet, with three curved trumpets branching from it; and a large tazza, with single trumpet rising out of the centre. These shapes, when fitted up lightly, look very effective. When going to arrange a stand, see that the glass is well polished, for half the effect depends on the brightness and glitter of the crystal, which sets off flowers to greater advantage than any other material. To keep glass clean it should be washed with nothing but cold water.

It is not necessary that the cut flowers used for decoration should be rare or costly; lovely arrangements can be got up with the hardy garden or common wild flowers, associated with wild ferns, grasses, and many other simple objects of the garden, wood, or field, when the rarer stove and greenhouse flowers are unattainable. As an example of this, we give a description of the drawing-room stands to which the first, second, and third prizes were awarded at a provincial show of the Royal Horticultural Society, held at Birmingham. The flowers used in the first prize arrangement were white water-lilies, white sweet peas, blue corn-flowers, white rodanthe, ferns, and wild grasses. That of the second prize consisted of pink cactus flowers, white water-lilies, pink and white rodanthe, ferns, and grasses. The third prize consisted of white water-lilies, white rodanthe, and oats. Many of the vases to which no prizes were awarded contained orchids and other choice and costly flowers.

I may also notice another vase composed wholly of wild flowers, to which was awarded the first prize, in the class for wild flowers arranged for effect, at the Exhibition of the Tunbridge Wells Horticultural Society. The vase itself resembled a Marchian one in form, and each tazza and trumpet was filled with *Dog-roses*, blue *Forget-me-nots*, brown-tinted sprays of *Oak leaves*, and British ferns; in each tie the flowers and foliage were most charmingly intermixed. In addition to those just named in the trumpet was placed a long trailing spray of white *Convolvulus*, which drooped down and was twined in a most graceful manner. This would make a good centre-piece for the dinner-table, as well as a drawing-room vase.

Dinner-table decorations, with cut flowers and fruit, require great taste in their arrangement. They should always be fitted up in a light and elegant style; nothing stiff or clumsy should be allowed.

Vases of numerous designs and in various styles in Etruscan ware, terra-cotta, porcelain, glass, and metal, can be purchased from the dealers in any size you require, and the trumpet glasses used for table decoration can be obtained in all sizes from nine inches to three feet in height. Zinc pans, neatly enamelled or painted, are used for protecting the carpet in rooms from water drippings and damp, when large plants, or arrangements of plants are used. For smaller plants requiring to be nearer the light, rustic jardinets, or ornamental flower-stands, made of wood, wire, or wickerwork, are used with good effect. Ornamental flower-stands should always be furnished with a zinc pan inside, to prevent any excess of water while watering the plants dripping down on the floor. Brown or varnished wicker baskets and pot covers are excellent receptacles for pot plants. They should be high enough to conceal the pot entirely, and the surface of the pots should be covered with *Hypnum* moss. Pot plants arranged in zinc pans and flower-stands should always be provided with flats to stand in; the superfluous water collects in them after watering, and is easily removed without causing any overflow or mess of any kind. When arranging pot plants in a flower-stand, a very pretty effect is produced by filling all round the pots with damp moss or sand, and placing cut flowers and fern fronds over the surface. This can be carried out in many little ways when abundance of flowers are at hand. For instance, a common small tray or soup-plate can be filled with damp sand, and fern fronds and grasses laid round the edge, and cut flowers neatly arranged over them. This makes a pretty table ornament, and is within anybody's reach.

In arranging plants in rooms, a great deal of taste is required; in fact, on this depends, to a great extent, the beauty and usefulness of plants used for that purpose. It must always be remembered that before we get the plants we use in our rooms they are grown in large, airy, well-lighted and ventilated greenhouses, and that it is against the law of nature to consign them from such quarters to a dark, hot, stifling room. Of course the same amount of light cannot be obtained in a room as they enjoyed in the greenhouse. It is this difficulty, therefore, that we must try to overcome as far as we can. Plants, therefore, should be arranged in a room so that they may enjoy the light and air as far as circumstances will allow. Some plants can stand for a considerable length of time in a darkened corner of a room, with little or no harm being done them, such as *Dracœnas*, *Palms*, *Agaves*, *Aloes*, *Ivy*, and the *Ficus elastica*, or India-rubber plant; they all have hard leathery leaves, and are able to stand the dry arid air of a room with impunity, but all soft-wooded, quick-growing plants, such as *Fuchsias*, *Geroniums*, or *Pelargoniums*, *Cinerarias*, etc., suffer severely if kept from the light. You should therefore have them always as near the light as possible, and change them every other

week for fresh ones from the conservatory, if you can, and turn them round every day, so that all sides may have the benefit of light equally. Never by any means allow them to get dry. The air in a room is always dry and arid, causing the moisture in the ball of the plant to dry up very quickly. If it ever happens that you allow the ball of a plant to get so dry that the soil shrinks from the pot all round, the best way to moisten the soil thoroughly again is to stand the pot nearly up to the rim in a vessel of water for half an hour or so.

Often I have seen poor ill-treated plants returning to the greenhouse they had left so fresh and beautiful, looking as limp and dried up as if the hot breath of a furnace had swept over them, and as begrimed with dust as if they had travelled a dusty road for a long summer's day. Plants neglected thus have their beauty spoiled for a whole season, when a little more care and attention bestowed on them would have returned them little the worse for their change of quarters.

Plants in rooms are usually placed in flats or pans for the superfluous water to collect in. This water should never be allowed to remain, as it tends to sour the ball of the plant by too much moisture and exclusion of air from the roots.

When arranging plants in ornamental flower-stands a good bold specimen plant should be chosen for the centre, and the smaller ones grouped tastefully around it with a free unrestricted natural grace, and all stiff formal arrangements should be avoided. This can best be done by a judicious mixture of graceful ferns. No other kind of plants break stiff outlines and bring out graceful effects so well as they. When trailing plants are used, they are better allowed to grow in their natural way than trained over globe or fan-shaped trellises. When trained in this fashion, on trellises, they have a stiff unnatural appearance, far from pleasing to the eye of taste.

Small single specimens of fine foliage plants are excellent for brackets on the walls, such as *Crotons*, *Begonias*, *Dracænas*, *Caladiums*, *Ficus*, and many others; also ferns, mosses, and flowering plants. The common *Ivy* is the best of all trailing plants for the decoration of rooms and passages by means of brackets. A continuous wreath can be carried along a wall in this way; or it may be draped around the window recess, or formed into screens for the drawing-room by being planted in ornamental boxes and trained over a wire trellis.

On the floor in the window recess, and in the empty fire-places, during summer, tasteful ferneries can be got up. In a fire-place especially, a natural screen of ferns, palms, and such like, is far before any other contrivance we see used for the same purpose; and if a small lead pipe be laid on from the water supply, a pretty little fountain can be had to play among the plants.

In the arranging of cut flowers in vases or trumpet glasses, you should always avoid using too many flowers. This is where a great many err; they crowd in flower after flower indiscriminately, and the result is a confused clumsy mass. Crowding of flowers should

always be carefully avoided, and the outline or contour kept as near as possible to what they are when growing. A vase of cut flowers can hardly be arranged too light and elegant. A few fern fronds, small branches of asparagus, leaves of variegated grasses, and sprays of *Selaginellas*, and slender creeping plants, should be placed first in your vase; then a few bold flowers of clear decided colours added. By using only one or two blooms of each kind, a great variety can be obtained. The great object in all cut flower arrangements should be to avoid heavy confused masses of flower and foliage. It requires a great deal of study and practice before you can be proficient in this. Ladies, with their nimble fingers and quick fancies, are always the best hands at floral decorations in the dwelling. It is a department in which they are always at home. This is as it should be. For shallow vases and table glasses, wet sand is the best thing you can use for keeping the flowers fresh; wet moss is also very good when the arrangements are only for a short time. Water should be as seldom used in flower-vases as possible, it is always so apt to spill. Of course, in glass vases, trumpet and finger glasses, it must be used, for sand would have a bad appearance seen through the glass, but in shallow vases, or where you can hide the glass with fern fronds or sprays, sand should be used saturated with water.

Flowers are always more natural-looking dressed with their own foliage. The *Lily of the Valley*, for instance, never looks so nice as when dressed with its own bright green leaves; and when roses are used, the aid of their foliage is almost indispensable; the only other greenery I care for seeing in connection with roses are ferns, and sometimes a few sprays of wild grasses.

If the cut flower arrangement is intended for gaslight, yellow is best kept out altogether. The colours that tell by gaslight are green, white, light blue, bluish pink, scarlet and crimson of every shade. With a good arrangement of those telling colours, backed with fern fronds, and rose tree leaves, and draped with sprays of *Linaria*, small-leaved *Ivy*, *Selaginella hortensis*, *Periwinkles*, or any other slender trailing plant, and a few grasses added for lightness, a very handsome vase of flowers can be made up for the drawing-room or dining-room.

Vases arranged with fruits and flowers form the usual decorations of dinner-tables in conjunction with pot plants of *Palms*, *Cycads*, *Dracænas*, *Ferns*, *Caladiums*, *Crotons*, and other fine foliage plants. Table decorations should always be light, airy, and graceful. If the specimen plants used are large and the cut-flower arrangement heavy, the whole thing is a nuisance rather than an ornament, obstructing the view and interfering with the freedom of movement. When decorating the table, then, use neat handy specimen plants, placing the largest in the centre, and have your vases and trumpet glasses lightly and elegantly got up.

Roses are the great favourites for all purposes where cut flowers are employed, and during the summer there is no stint of that lovely queen of flowers. In the autumn, winter, and spring, the principal flowers used are *Orchids*, *Azaleas*, *Camellias*, *Spring flowering*

bulbs, Lily of the Valley, Cinerarias, Pelargoniums, and all the usual forced flowers of the season.

The commoner flowers of the year make as good arrangements as the rare and high-priced Orchids and hot-house flowers. Nothing can excel the effect of the *Rose* or the *Iris*. *Dahlias, Gladioli, Geraniums, Fuchsias, Stocks, Asters*, and in fact all the common summer bedding plants, are excellent to cut from. Some of the hardy herbaceous border flowers are really gems; for instance, the *Aster alpinus alba* is just as good a white flower as we need wish for; while the *Carnations, Picotees*, and *Pinks* are the favourites of all cut flower decorators; *Pentstemons, Antirrhinums, Sweet Williams*, and *Phloxes* are also good cutting flowers. And for winter table decoration what could be better than the richly-coloured variegated *Scotch Kales*; their beautiful crisped and curled leaves are the most desirable and handy bits of foliage we can come at during the winter months. Even the country lanes and hedgerows, nearly all the year, abound with excellent materials for decorative purposes, requiring only the hand of taste to arrange them properly. And very interesting and pretty indeed is a vase tastefully filled with the wild natural products of the woods and fields, and country lanes.

STOCKS FOR STANDARD ROSES.

DIFFERENT roses require different stocks. A tree that of itself would make a yard of wood in a season, is confined and injured in its operations by having, perhaps, a single bud upon it of some rare and tender sort of rose, which makes but feeble and delicate shoots.

If left to itself under such circumstances, the extra sap would find a speedy mode of escape, by sending forth innumerable shoots from below the bud, and the bud would soon have but a bare subsistence:

Roses which are free growers, such as the *Noisette*, etc., will generally be found to succeed better upon the wild stock than others, their habits of growth being more assimilated. The wild briars grow very late in the year, perhaps more so than almost any other wild plant: and the free-growing bud avails itself of, instead of checking, this propensity, and draws up the whole sap the standard can produce; thus keeping up the full activity of the tree, thriving and recovering a stagnant stem better, and being less encumbered with suckers than delicate sorts. Comparatively speaking, the *White Moss*, on the contrary, can hardly be kept alive when grafted upon the briar.

Again, if a free-growing bud, such as the *Noisette, Greville*, etc., were put upon a small stock, the bud would entirely drink up the sap of the stock; and instead of making a fine bushy head, would either grow in one long shoot, or, at all events, make a small and mean head, in comparison with what it would have done upon a

larger stem. Stocks, therefore, should be chosen with reference to the purposes they are intended to be put to; the bringer being desired to cut them above the first fork (both in order that the whole stem may be preserved, and that the strength of shoot they are likely individually to produce the succeeding summer, may in some degree be judged of from the quantity of head to be cut off, and its clean and healthy appearance); it should be remembered, that stocks being so very easy to procure, none but the very straightest and best should be chosen; and the rejected ones may be planted in some out-of-the-way place, to be used in case they should be wanted. About a third more stocks should be chosen than are absolutely wanted, and the others may be laid in the ground, as a *corps de reserve*; they will most likely be worked in the season, and without costing any trouble, except as to budding, according to their health and strength; the advantage of a supply of different heights, sizes, and sorts will be obtained.

When the stocks are taken up, they should be kept as short a time as possible out of the ground, as the air injures the root. This is of the greatest importance, as the strength of the expected shoots will mainly depend upon it; but if they have been weakened by lying out of the ground, they will regain a portion of their strength by being much shortened in the stem; for the roots of all trees being proportioned to the trunk they have to maintain, it is evident that an injury to the one should be followed by a reduction of the other; and thus, to a certain extent, the more head removed in the autumn, the freer supply of new wood will be produced in the spring.

If it be desired to keep stocks some time before planting, they must, like all other trees, have their roots covered with mould, which is technically called, laying by the heels. When stocks are sent any distance, a puddle of clay and water should be made, and the stocks dipped into it, so as to form a coating to defend them from the wind, and then, being packed up in an old bass-mat, they will carry without injury.

The trimming of the stocks is next to be considered: first, as to the requisite height; secondly, as to the mode. The heights most desirable are, four feet, three feet, two feet six inches, two feet, one foot six inches, one foot. The manner is, by a clean slanting cut, at about an angle of fifty degrees, the upper part of the remaining stock being a quarter of an inch above a bud. If the bud be not enough marked to show its position, let the lower part of the slant be that distance above the ring denoting where the bud is to spring from, and the extra plant can be afterwards removed. The object in cutting so near to a bud is, that when the first shoot starts, the bark may begin to form over the wound; but if there is any distance between the wound and the base of the new shoot, this will not be the case, and the dead wood will gradually eat into the stock. If, therefore, the excision is not made in such way that the stock may begin to be covered the first year, it will be better to leave a few inches (namely, as much as is between the bud cut off, and that desired to produce the new shoot), that the tender shoots which spring from the inserted buds may be tied to it, delaying its removal

till the graft has become strong enough to heal the wound when inflicted. This will in general be about eighteen months after budding, when care must be taken to cut close to the base of the shoot, which enables the rising sap to cover the wound more easily. In all cases the wound should be covered with either the under-mentioned mixture immediately, and a small piece of grafting clay, or, at least, a little mould should be rubbed upon it.

Trimming the root is a matter, if possible, of even more consequence, because but one more opportunity will be afforded of reviewing this part of the work, and perhaps none of retrieving mistakes. The longevity of the plant depending mainly upon the roots, it is necessary to shorten all those which are long and thick, and to remove heavy lumps and clumps of unserviceable wood, leaving as nearly as possible only such parts as are furnished with small fibres and roots. This will afford an opportunity of planting the stocks with greater care, and of forcing them to make fresh shoots (which in good ground they will be sure to do), and thus continue to improve. The roots, however, require the *same attention* as the branches, for a closer investigation of the subject. It is therefore only necessary to add here, that attention must be paid to these points; and for the greater convenience of cutting the roots, which are sometimes twisted and in cramped positions, it will be desirable to borrow a carpenter's small saw, as well as a hand-saw; and thus every facility being afforded in cutting the roots exactly as they may require, the work will be much expedited as well as improved; but it must be remembered, that whenever a saw is used, either to root or branch, the surface left must be smoothed over with a knife. Having finished these operations, and ascertained the heights desirable for the stocks, this is the proper time for shortening them, previous to planting in rows for budding upon.

PROPAGATION OF CAPE HEATHS.



CAPE HEATHS are propagated both by seed and cuttings. In propagating by seed, select wide-mouthed cutting-pots, or, what are better, pans provided with holes for drainage. Fill them half their depth with potsherds, the finer particles being placed as a top layer; immediately above this put a layer of coarse mould, filling the pot or pan to within three-quarters of an inch with fine sandy peat, pressing all moderately firm and perfectly level. The latter is most essential, as the seeds are so minute that an uneven surface greatly retards the growth of the young plants. The seeds being deposited, with a very fine sieve scatter a slight covering of white sand, or very sandy peat, on them, barely enough to cover them; damp the surface, and keep it so till the tiny plants appear. And here arises a difficulty, or, I should rather write, a troublesome case. I have seen it recommended in books (and put in practice, too), to

cover the surface of the mould in which small seeds are sown with chopped moss, to keep the surface moist—a practice which experience bids me say is very bad. It induces a weakly and etiolated growth, at the time when all the elements furnished individually by, and in the combination of, air and light, should exert all their influence on the advancing plant. And should the unlucky cultivator leave his delicate charges reposing under the influence of the protecting moss a few days without his immediate superintendence, the young plants, struggling for light and liberty, will have become entangled in their fostering canopy, which, on being removed, carries with it the greater portion of the plants, leaving the remainder weakly and deformed.

A mode which will succeed well is this:—Sow your seeds in spring, as above described; place the pots in a cool and shady situation, protected from rains, but having free benefit of a circulating atmosphere. If you have only a few pots, under a hand-glass raised at the corners, behind a north wall, is an excellent situation. When the young plants appear, gradually inure them to the full atmospheric and solar influence. If your seed is sown early, the plants will of course be sufficiently strong to be potted off the same season; but if late, and the plants are small and weak at the end of the summer, they had better remain in their seed-pots, occupying during winter a light, cool shelf in the heathery or greenhouse, potting them off early the ensuing season.

The usual mode of propagation is by cuttings; and as the shoots adapted for the purpose are suitable at different seasons, according as the plants are early or late bloomers, no season can be recommended in preference to another for carrying out the operation. Thus, most of the *ventricosas* are late bloomers; the growth, therefore, is proceeding during autumn—in fact, they continue to grow the whole of the winter. Fully-organized wood adapted for cuttings may, therefore, be procured early in spring. The same may be said of *verticillata*, and others easily recognized. The winter-blooming heaths, as *Scotia*, *vernix*, *hirta*, *costata*, *ardeus*, *vernix coccinea*, *gracilis*, etc., will consequently produce cuttings later in the year, and so of others in succession. As a rule, to prevent unnecessary trouble and disappointment, never select cuttings till the wood is ripe (fully organized). This term cannot be rendered intelligible by words or drawings, or, indeed, in any way short of experience. The best explanation that can be given is this:—Select your cuttings from wood of the current season's growth, and let that portion at which you intend roots to be formed neither be too soft (cellular) nor too woody. If the former, damp will quickly destroy it; if the latter, no roots (or, if any, very feeble) will be emitted, but the cutting, by absorbing moisture through the medium of the sand in which it is planted, and losing little by being protected by the bell-glass, will remain green and healthy-looking for months,

“Holding the word of promise to the eye,
But breaking it to the hope.”

It would require an elaborate treatise to show when and why a

particular shoot is in a fit state for the purpose of propagation, and even then the subject could not be so well explained as by a few practical investigations under the assistance of a proficient. As it has been observed that the cuttings from a collection of Heaths are obtained progressively, it follows that the propagator's operations must be regulated thereby. The earliest struck plants, like the early sown seeds, will be fit for potting off the same season, and by giving them a liberal shift early in the following season, beautiful plants will be produced by the autumn; whereas, cuttings inserted later in the season had better remain in their cutting-pots during winter, as by potting off late in the autumn no advance will be gained, and a risk incurred of losing them in the winter from their not being established in their pots.

In preparing cuttings, select pots like those described for seed, and prepare them in a similar manner, with this exception—on the top of the fine, sandy peat, place about half an inch of white sand, clean and sharp, leaving a quarter of an inch of the pot not filled. Then press the whole moderately firm, water with a fine rose, and place the pot aside during the preparation of the cuttings. Having selected them as previously described, with a sharp knife or pair of thin-bladed scissors cut away the foliage from the base of the shoot upwards, till you have arrived half an inch above the part intended to be the base of the cutting; then with your knife separate the cutting from the other part by a diagonal incision, which is less liable to injure the tissues of the cutting than separating it horizontally. A perfectly smooth and uninjured base is essential to success. With a small dibble insert your cuttings the depth of the sand; place over the whole a bell-glass, having previously, before the insertion of the cuttings, given the whole a slight watering; plunge the pot in a cool, shady situation, and wipe the moisture from the glass often. If in a month or so after the insertion of the cuttings you could give them the assistance of a gentle bottom-heat, the emission of roots will be accelerated. As the periods of rooting of the different species vary much—from five or six weeks to as many months—the quick-growing kinds and those of an opposite character should have separate pots.

GRAFTING.



THIS is one of the nicest operations that can engage the attention of gardeners, and generally carries them onward through the spring months full of anticipation; it has been successfully performed during midsummer, as well as in spring, although the following remarks bear principally upon the latter course.

About the middle or end of February, select the grafts or scions from shoots of one year's growth, reducing their length to six or eight inches, keeping each sort separate; put them into the ground, there to remain until the sap shall have become active in the stocks

February.

on which they are to be put; this will, in ordinary seasons, be about the middle of March, commencing with cherries, then pears, plums, and lastly, apples, which will succeed when put in any time up to the middle of April.

Stocks on which to graft may be reared from seeds, although many sorts of apples grow easily by slip, even when half an inch in diameter.

Paradise stocks, also—which are obtained by slipping those trees of mature growth which throw out fibrous knots, which knots become the roots, when put under ground—should be grown to graft dwarfs upon; they present a very handsome appearance in flower borders, and grow well in large pots or tubs. When you are ready to put on the grafts, have by you a sharp knife, a triangular-shaped wedge for raising the bark, a mixture of clay and horse-dung thoroughly incorporated, and a supply of bast strands, well wetted.

In this operation there are three points to be attended to: first, the preparation of the stock; secondly, the preparation of the scion; and thirdly, the adjustment of the one to the other. These vary according as the stock is old or young. In preparing the stock, it is necessary to bear in mind at what height you require to put in the graft: if for a wall or espalier, this should be about six inches from the ground; if for a standard, from three to six feet. For young stocks, that mode called tongue grafting is most suitable, while for old ones, crown grafting is more certain of success; indeed, a knowledge of these two methods is sufficient for all practical purposes, our object being to exclude any operation which does not combine efficiency with economy. These, then, I shall notice separately.

1. TONGUE GRAFTING.—Prepare the stock by making a clean, slanting incision nearly two inches long, and at a height suited to the result wished, and with the knife cut a slit downwards in the form of a tongue, beginning at the upper third of the slope; next, prepare the scion, by making an incision similar, and of equal length, to that on the stock, making a slit or tongue in like manner; after which proceed to adjust the scion to the stock by inserting the tongue within each other, being careful to have the inner bark of both touching on one side; then tie it carefully with a strand of bast, after which, having first wetted the stock and scion, apply the clay compost in such bulk as to exclude the air and preserve the scion moist until adhesion takes place; surround the whole with a little moss retained with a strand, which will prevent it from cracking, as well as prove a medium for administering moisture, if the weather should prove too sultry.

2. CROWN GRAFTING.—This consists in making a horizontal cut in the stock at the proper height; pare it smooth, and on the smoothest side of the bark make a slit, one and a half inches in length, down to the wood; then, with the triangular wedge, raise the bark only on one side; this is much superior to the ordinary method of raising both sides, as it is more successful, and much more easily adjusted, as will be seen in the tying. Prepare the scion by a slanting cut, making a shoulder on which to rest it when inserted;

pare the bark slightly along the edge which is to be applied to the unraised bark of the stock; then, having inserted the scion, take a strand of bast and pass it always round in the same direction, so as to press the pared edge to the unraised bark; after this, cover with clay, etc., as directed for tongue grafting. This mode of crown grafting is by far the most successful of any which I have seen or tried, and is more easily executed.

A further precaution which I use, is always to include a bud in the under part of the scion, so that, after the clay is removed, should any accident occur with a favourite graft, the chances are in favour of being preserved in the bud.

As to the future management of grafting stocks, it is necessary to keep down all young shoots, to remove the clay and ligature about the beginning of June, to allow for the swelling of the bark, and replace by another ball of clay without a ligature; this I prefer to applying a ligature without clay, which is generally done, as it more effectually secures the grafts from wind or accidents. The clay may be finally removed in August.

ON LAYING OUT GARDENS.



IN laying out gardens, it is necessary to observe a proper distance in planting trees, and to make due allowance for future growth. It is equally important to consider their sizes and positions in relation to the garden itself and to each other. Large trees in small gardens are very incongruous, and should by no means be admitted. Fruit trees should all be of the dwarf kind, and ornamental trees and shrubs should be chosen in reference to their compactness when full grown. Taste demands attention to this rule, as it is utterly impossible to secure beauty in a garden overshadowed with heavy foliage. Utility puts in an equal claim, as no vegetable productions can be expected to come to perfection without abundance of light and air.

In small gardens, when it is requisite to partition off some compartment for kitchen vegetables, or for the necessary frames and manure heaps, it is better to have ornamental hedges than walls, as the former give an air of greater extent than the latter do. White-thorn and Privet, mixed, make a substantial hedge, green all the year round; but this cannot be compared with Holly, which, both for beauty and effectiveness, is unequalled. The general objection to holly is that it grows so slowly; but if properly planted and afterwards attended to, it will rapidly attain sufficient height for the purposes of a screen.

In the kitchen garden, the herb bed should be put in a situation as near the house as possible, that unnecessary trampling on the paths may be avoided in bad weather. This reminds me of the importance of a proper arrangement of scrapers, which should be introduced frequently, that the feet may be freed from dirt before

leaving the beds. Gardeners are sometimes provokingly careless in reference to these minor matters, and in winter will come off a cabbage compartment with their shoes as heavy with mould as a ploughman's. This mould is scattered on to the paths, spoiling the gravel and offending the eye. If there is a sufficiency of scrapers they have no excuse for this neglect, and you may reprove offenders without fear of the retort, "Sir, how are we to help it?" For the same reasons, see that you allow no clayey or chalky gravel to be introduced to your premises. It may be difficult to get the right kind, but you had better pay six times as much for it than put up with an inferior article. Common stuff, not half sifted, may look well in fine weather, but wait till winter, and you will repent your bargain.

Box does as well as anything else for edgings in a kitchen garden. I have box in some parts and large flint stones in others; but I prefer the box. It is charged against it that it harbours snails and other vermin; but so will anything you use as a bordering. Under and round about my stones I find as many slugs as in the box. In reference to the mode of planting Gooseberry and Currant trees, whether in clumps or singly, round the borders, no rule can be laid down. Both plans have their conveniences and inconveniences. It must be observed, however, that, if planted together, a considerable space should be left between each bush. The clump system has this advantage, that birds can be more easily kept from the fruit in summer and from buds in the winter. An idea is prevalent that Raspberries do best in damp, shady situations, but it is a false one. The plants like a deep, rich soil, but they cannot have too much sun, if fruit of fine flavour is desired.

OUT-DOOR PLANTING.



THE first thing to attend to in out-door planting is, trenching the land. This must be done to a considerable depth; say about two feet or thirty inches. If an orchard or flower-garden is being laid out for the first time, the general drainage must be looked to before success can be hoped for. But if a new bed only is contemplated, or the planting of a single tree, the soil must be well disturbed; and if the subsoil is inclined to retain wet, an artificial drainage of bricks and stones is desirable. The digging must also extend much beyond the hole necessary for admitting the roots of the tree; the further this is done the better, as it is often the case that the surrounding soil has not been disturbed for centuries, and roots placed in a hole encompassed by such a hard mass, will not ramify, but will be similarly situated with those in pots.

Trees and shrubs should always be planted high, to counteract the evils arising from unsuitable subsoils, and also to allow the air to get at the roots. People seem to think that, provided the stem appears above ground, it matters nothing where the roots are, and

hence we often see newly planted trees covered up to the stem with paving stones, or gravel, and perhaps so situated that the soil is daily trodden on right up to the unfortunate prisoner. The nearer the roots are to the atmosphere, and the more porous the soil above them is, the better. I have just planted some fruit trees on the top of trenched ground, without digging a hole at all. There will in this case be a small mound, visible above the surface, and the trees will require a strong stake, and careful attention as to watering in dry days in spring; but with these precautions, I have no doubt the plan will be successful. The smaller roots should be carefully preserved, arranged round the tree as much as possible, and kept near the surface. It thus appears that in transplanting, care should be taken to preserve the bunches of fibres which are too often torn from the stronger roots, and left in the ground. It is to be lamented, that even in nurseries too little attention is given to this matter, for we often see trees sent out with only a strong stick of old root attached, all that was really valuable having been cut or rent away. The remedy for this unworkmanlike treatment is for amateurs to be more knowing on such matters themselves, and to refuse to purchase trees which are so roughly treated. Firmly tread down and water, and your work is done, always remembering to keep a watch as to drought during the first spring and summer.

HINTS ON SMALL GARDENS.



Treating of the subject of small gardens, it may be as well in the first instance to consider the subject of gardens which it is desired to alter or improve, and it often happens in this case that a considerable portion of the space is occupied by one or more trees. Now trees are decidedly out of place in little gardens; and unless they are useful as screens, or are regarded with particular favour, we would strongly recommend their removal, as few plants will grow under them, and they are very littery in the autumn; but if it is desired for one or both the above reasons to retain them, care should be taken to select such plants and shrubs as will thrive in their shade, or exposed to their drip. Or it may happen that the old garden is filled with some deciduous shrubs, as lilacs or snowberries, which during the winter months are about as ornamental as a bundle of sticks; in the spring they produce a few flowers possibly, but in the summer the dust and smoke render them anything but ornamental; and in the autumn they make the whole place untidy, besides they are gross feeders, and extract all the nutritive qualities from the soil, and sap the moisture a considerable distance around, and make it impossible for smaller plants to thrive near them; therefore we would recommend that such, with all other old or worn-out shrubs, whether deciduous or evergreen, be discarded without mercy. Sometimes we have seen the little frontage overrun by a species of starwort, or what is worse, by couch or twitch grass; the

roots of these should be carefully collected, and burned if possible, or they will become a continued nuisance. If there be any box edging, this should be taken care of, and if there are any plants or shrubs that are ornamental, or might become so, they should be laid aside; in other respects, improving an old garden is much the same as laying out a new one. With regard to soil and drainage, very little need be said; it would be unwise to describe expensive processes to those who cannot make use of them. The soil must generally be taken at what it is, to make the best of it; but for the benefit of those who desire to know, and can get the material, we would observe, that if ground is light and quickly loses moisture, a dressing of fat loam, or even clay, will greatly improve it; or if it be stiff, heavy, or retentive, a dressing of road-scrappings, or any grit would improve it. Drainage will scarcely be required, unless the ground lays very low, and the soil is of a retentive nature; where this is the case, first find some outlet, then lay one or more drains towards it—these are made by laying pipes or tiles in a trench, which slants towards the outlet; in lieu of tiles, the trench may be filled with brick rubbish, broken crockery, or anything that will preserve an open space for the water to run through; the drains may be covered, just allowing that the water can filter to them. When the ground has been deeply dug or trenched, the next thing to consider is the plan or shape. The designing of a garden will admit of as much variety as the printing of calico, or the staining of paper, yet there is too great a tendency to imitate, and too little originality. An original design, however tame, is at least, something fresh, and far better than copying from neighbours. We leave it to those who may have such an affair in hand, to exercise their ingenuity, and bring out something new, merely observing that the circular and oval form is preferable to the square, and that the curve line is better than the point or angle, and that one bold large bed or border will have a better effect, and be easier to keep tidy, than a number of intricate ones which are productive of much trouble, and often look puny and simple. We cannot recommend the introduction of turf into little gardens, unless it can be well and thoroughly attended. A broad sweep of lawn in a large garden is a noble feature, and even in a small garden, well-kept grass is highly ornamental; but the few square feet of neglected grass in the little frontage, has a miserable appearance, and for the reason that it might not be kept in trim, we advise that it be kept out of the little garden.

Having fixed on a plan, and marked out the paths, the next affair is the edging. If box is obtainable, nothing can be better for the purpose. Any one who has seen box edging may guess how it is planted. The ground should be made firm to prevent its sinking; it should be exactly level, and of the proper height; the edge should be cut smoothly with a spade, the box laid evenly, and the soil pressed to it immediately, and if in dry weather, it should be well settled in with water. The surplus soil from the path should be thrown on the border to raise it a little as it recedes from the edging. But if box edging is not easily obtained, the next best thing to it is white arabis; the next to that is thrift, or *Statice maritima*, Gen-

tiana acaulis, London Pride, daisies or primroses, each of these will make a very neat edging, and flowering in their season will look very pretty. They may be planted in the same manner as box, but the usual mode is to plant them with a dibber; having made the ground firm by treading, of a proper height, and exactly level, make a mark where the edging is to be, then take divisions or offsets of any of the above, and plant them about six inches apart, either in one row, or one each side of the mark in zigzag fashion. It is a common practice to make edgings of deal boards; this is decidedly objectionable, because they are not durable, and they present a stiff and formal appearance, which is anything but pleasing; slates or tiles are more durable, but not more ornamental; a row of flints, or large pebbles are better than either. Where burrs are obtainable they make a good edging on which alpine plants may be allowed to trail; cuttings of ivy or *Cotoneaster microphylla*, planted after the same manner as box, will strike root and make a fine bold edging, but require judicious pruning to keep them within bounds. As we before observed, a few inches of soil from the path should be thrown on the border; the hollow thus left should be filled with brick rubbish, or any coarse material; to within a trifle of the height the path is to be, make this firm, and if gravel can be obtained to finish off with, nothing better can be desired. It is only necessary to level the gravel, tread it well, and smooth it off with the back of a rake, when a roller will finish it; but as every one does not possess a roller, it may be trodden and smoothed again and then finished with the back of a spade. If, as it sometimes happens, gravel is not to be got, the next best thing is to pave the path with pebbles; having prepared it as for gravel, lay the pebbles close together, and run sand or fine earth between them. Next to pebbles we believe burnt clay makes the best path, although we never tried it ourselves; road sand will be better than nothing, and common garden soil worst of all. If the weather should be dry, see that the edging is well watered, for much of the success in planting depends on everything being settled in at first; care should be taken that the paths are so that no water can rest on them; they should be slightly higher than the border, where the water is more necessary.

Having accomplished this much in laying out the garden, we must next consider the subject of planting. To describe all the various modes by which a garden may be kept fresh and lively during the twelve months of the year would fill a large book indeed; nor is it necessary here to give more than one or two of the least expensive. The plan whereby a little garden may be kept neat and tidy, at the least possible outlay and with the least amount of labour, is to plant it with dwarf compact young evergreens, which may be procured in abundance and at a cheap rate at any of the nurseries around London. Evergreen shrubs may be made to yield a most lively and interesting appearance, if they are kept dwarf and within bounds, and are allowed sufficient room. The following are the names of such shrubs as are most easily procured, and will thrive in almost any soil or situation:—*Aucuba Japonica*; *Alaternus*; *Box*, plain and variegated; *Berberis*; *Sweet Bay*;

Common Laurel ; Euonymus, or spindle-tree, plain and variegated ; Gum Cistus ; Hemlock Spruce ; Holly ; Laurestinus ; Portugal Laurel ; Phillyrea ; Common Irish Yew ; Arbor vitæ ; Juniper Savin ; Rosemary ; Lavender ; and Rue. Of the above, the holly, the yew, the bay, and arbor-vitæ grow largest ; the four last are most dwarf, and should, therefore, be nearest the edge ; but all may be kept close and compact by timely and judicious pruning. In planting them, care should be taken that the hole be made large enough, and that they be not buried deeper than they have been used to, and that they be well settled in with water, and no matter what time of year it is done. But there are some who would prefer deciduous shrubs to evergreens, on account of the blossoms they produce, which is certainly reasonable ; but for reasons which any one may discover who will give attention to the subject, deciduous and evergreen shrubs should not be mixed ; let them be by themselves, and a collection of the following will look gay in their season :—*Althea frutex*, red and white ; *Corchorus Japonica*, yellow ; *Deutzia gracilis* and *scabra*, white ; *Pyrus Japonica*, scarlet and white ; *Ribes*, red ; *Spiraea*, pink and white ; *St. John's Wort*, yellow ; *Syringa*, white ; *Lilac*, white, blue, etc. ; *Guelder rose*, white ; *Weigelia rosea*, rose ; *Daphne mezereum*, red. Of these the two latter are the dwarfest ; to which may be added hardy azaleas for the front row ; but the latter require peat to grow in. They will not thrive in common soil. None but young healthy plants of the above should be admitted, and they should be kept within bounds by timely and judicious pruning. The same rule should be applied to these as to everything else, that is, to settle them in with water at planting, and afterwards till they become established, or so long as the weather holds dry. Some persons have a particular fancy for American plants ; these are more expensive than common shrubs, on account of the peat which is necessary for them to grow in, but they are splendid objects when in flower. Young plants of hardy hybrid rhododendrons may be had tolerably cheap at most of the London nurseries. If these are planted in a centre bed, they will have a fine effect in the flowering season. To plant them, either the whole bed should be dug out to the depth of two feet or so, and this filled in with chopped peat, and the Americans planted therein ; or each hole should be made considerably larger than would be otherwise required, and this filled in with peat. If the subsoil is gravel, it would be better to lay a little clay at the bottom of the bed or of each hole, for American plants require a great deal of water while they are growing, and if the soil loses moisture very quickly, they will not do well. Other Americans, which require a little peat, although they will grow in other soils, are—*Andromedas*, *Arbutus*, *Daphnes*, *Kalmias*, *Magnolias*, *Heaths*, *Empetrum*, or *crowberry*—the two latter, being most dwarf, are most suitable to be nearest the edge. A little garden may be planted with shrubs alone, and yet be made to maintain a creditable appearance the whole year ; but many prefer the space of a yard or so next the edging to grow flowering plants. This space may be planted with hardy herbaceous plants, which are always green, and thus in keep-

ing with the other parts, or it may be planted with bedding plants or annuals, to enliven it during the summer. Some might wish to have the whole space planted with hardy herbaceous plants, which all produce flowers of more or less merit, and some of them are evergreen, such as the following, which are all of dwarf habit: *Antirrhinum*, various colours; *Alyssum*, yellow; *Arabis*, white and blue; *Bellis*, or daisy, various; *Cerastium tomentosum*, white; *Cheiranthus Marshallii*, yellow; *Caltha palustris*, yellow; Christmas rose, white; *Dianthus*, or pinks, cloves, carnations, etc., various; Double white *Feverfew*; *Gentiana acaulis*, blue; *Geranium*, red; *Helianthemum*, or sun rose, scarlet, yellow, etc.; *Iberis*, or candytuft, white; *Iris*, various; *Lysimachis nummularia*, or moneywort, yellow; *Phlox nivalis procumbens*, etc., red, white, etc.; *Potentilla*, various; *Pentstemon*, red; *Primrose*, yellow, lilac, red, etc.; *Saxifrage*, various; *Pansy*, various; *Ledum*, various; *Veronica*, blue and white; *Vinca*, or periwinkle, blue and white; *Violets*, blue and white. To which may be added *Farfugium grande*, valued for its fine variegated foliage; also *Thymus Corsica*, for its beautiful scent. All the above are evergreen, and will make a garden look fresh in the winter. But there are other sorts equally valuable for their flowers, but which die down in the autumn, such as *Alstr meria*, various colours; *Anemone apennina*, blue; *A. nemorosa*, white, etc.; *Arum maculatum*, green; *Campanula*, blue and white; *Catananche*, blue and white; *Centaurea*, various; *Chelone*, red and white; *Dielytra*, red; *Dodecatheon*, pink and white; *Geum coccineum*, scarlet; *Hepatica*, red, white, and blue; *Mimulus*, various; *Monarda*, red and purple; *Poppy*, scarlet; *Plumbago larpente*, blue; *Ranunculus*, yellow; *Rocket*, white and purple; *Trollius*, white and yellow; *Statice*, blue. These seldom exceed eighteen inches in height. The following of taller habit:—*Aconitum*, or monkshood, blue, white, and yellow; *Anchusa Italica*, or bugloss, blue; *Anemone Japonica*, red; *Aquilegia*, or columbine, various; *Aster*, or starwort, various; *Chrysanthemum*, various; *Campanula*, blue and white; *Delphinium*, or larkspur, blue; *Fraxinella*, red and white; *Geranium*, various; *Hemerocallis*, or day lily, yellow; *Lobelia*, or cardinal flower, scarlet; *Lychuis*, scarlet and white; *Phlox*, various; *Solomon's seal*, white; *Saponaria*, or soapwort, light pink; *Solidago*, or golden rod, yellow; *Tritum uvaria*, scarlet and yellow; also *Fuchsias coccinea* and *gracilis*, which are perfectly hardy, although they die down in the winter. A selection of bulbs might with advantage be interspersed amongst the foregoing; they are mostly free-blooming, and of bright colours, and add considerably to the beauty and cheerfulness of a garden. The more hardy kind of bulbs are not expensive, and they rapidly increase when once in the ground. Those best adapted to little gardens, and which will thrive almost anywhere, are winter *Aconites*, yellow; *Snowdrops*, white; *Crocuses*, various; *Star of Bethlehem*, white; *Scilla bifolia*, white, etc.; *Narcissus*, or daffodil, yellow; *Grape-feathered* and *starch hyacinths*, blue and white; *Snowflakes*, white; *Dog's tooth violets*, white and purple; *Anemones*, various; *Allium moly*, yellow; *Trigridia*, various. These are mostly very dwarf; others of taller habit

are Late Tulips, various; Crown Imperials, red and yellow; Lilies of various kinds, as *L. candida*, white; *L. martagon*, scarlet, yellow, etc.; *L. tigrinum*, deep orange, spotted, and several others. Bulbs that are generally imported, and may be had in abundance in the autumn, at which time they should be planted, are early tulips, hyacinths, narcissus, jonquils, etc.

From the foregoing list a selection may be made which will keep the little garden in blooming condition nearly the whole year, and when once planted they will continue for years; but as some of them grow much faster than others, it will be necessary sometimes to take them up, and divide the roots of the freer growing sorts. If all are kept clean and tidy, and the ground disturbed between them often, these will give as creditable appearance to the little garden as anything. But yet some may prefer other modes of planting the little garden. Such plants as the above might be placed widely apart, and bedding plants or annuals placed between; others may be fond of annuals, and desire to have them alone. Of annuals some may be sown in September, to stand the winter, and flower early in the spring; other sorts, if sown early in the spring, flower early, and are soon over; some flower more in the summer; others flower till the winter's frost cuts them off. The seeds of most kinds of annuals can be procured very cheaply, but very cheap seeds should be looked on with suspicion, for there is much deception practised by cheap venders. It is worth knowing that annuals may be kept in bloom a long time merely by picking off the old flowers as fast as they begin to fade. Where this is not done, they perfect their seeds in abundance, and some sorts are soon over, and have ripened a quantity of seed before they have done flowering. It may be also worth knowing by what means success is most likely to attend the sowing of small seeds. There are various causes of failure—the ground may be too cold and wet; in this case the sowing should be put off till warmer weather; or the ground may be too light and dry, when it will be as well to sow immediately after rain; or the ground may be too rough, and the seed gets buried too deep. To prevent this, it is a good plan to press the spot with the bottom of a garden pan or saucer, and on the flat level place thus made scatter the seed and cover very lightly with very fine earth. The seeds should be buried slightly or otherwise according to the size; for instance, the seeds of *salpiglossis* and others, being very small, require but the slightest covering; those of larkspur, being larger, may be buried nearly half an inch; while lupins of the larger sort may be buried more than an inch. Care should be taken to give them sufficient room either by sowing thinly or by thinning them after they are up; six in a patch is quite enough of anything, and the thinnings will bear planting again. If the ground remains moist till the seeds are up, so much the better, but if watering is necessary, they should be kept moist, for if the ground becomes caked over the seeds, they will not grow. The following are some of the kinds that will grow almost anywhere:—Sweet Alyssum, white; *Aster tenellus*, blue and yellow; *Campanula*, or Venus' looking-glass, blue; *Catananche lutea*, yellow; *Claytonia perfoliata*, white; *Cynoglossum linifolium*,

or Venus' navel-wort, white; *Godetia tenellus*, purple; *Gypsophila muralis*, pink; *Kaulfussia ammelloides*, blue, rosea rose; *Leptosiphon*, various; *Limnanthus*, various; *Linaria Peregii*, lilac; *Lupinus alpinus*, blue and white; *nanus*, lilac and blue; *Malcomia maritima*, or Virginian stock, rose; *Nemophila*, various; *Mignonette*, *Nolana*, various; *Saponaria Calabrica*, red; *Scorpiarus vermaclatus*, yellow; *Silene procumbens*, pink; *Trifolium aurantiacum*, yellow; *Veronica syriaca*, blue and white. These are of very dwarf habit, seldom growing more than nine inches in height; therefore, should be placed nearest the edge. The following average from one to two feet in height:—*Candytuft*, white, pink, etc.; *Coreopsis*, various; *Cacalia*, various; *Convolvulus minor*, blue; *Collinsia*, various; *Clarkia*, various; *Cape marigold*, white and purple; *Eutoca viscida*, blue; *Cerithe*, or honeywort, yellow and purple; *Hawkweed*, red and yellow; *Jacoea*, crimson; *Ononis pubescens*, or rest harrow, yellow; *Nasturtium*, dwarf, various; *Nigella hispanica*, or love in a mist, blue; *Godetia*, various; *Gilia*, various; *Roman nettle*, green; *Rose Campion*, red; *Schizanthus*, various. There are some still taller annuals, which range from two to three or four feet in height: *Datura*, purple and white; *Helichrysum macrantha*, white and pink; *Lavatera*, red and white; *Lupinus Dunettii*, yellow, purple, etc.; *Malope*, crimson and white; *Persecaria*, tall, red; *Princes Feather*, crimson; *Palma Christi*, *Xeranthemum*, various. All the above are called hardy annuals, and may be sown in the open ground any time in March, April, or May. Many of these, if sown in September, on a warm border, will stand an ordinary winter, and will flower early and strong, and produce seeds which, if sown as soon as ripened, will grow and flower the same autumn; besides, if annuals are sown late, they will bloom late, and some of them, even if sown early, will continue flowering till the early frosts of winter cut them off. Thus, even with annuals, it is quite possible to keep the ground covered during the whole year, if not with blossoms, at least with leaves, which are the next best things. These are but a portion of what might be named, but a small packet of seeds of all the above would fill a large garden. Half-a-dozen sorts are sufficient for a small one, and it is worth while to remember that nothing is worse than over-crowding; each plant will require a space proportioned to its height and breadth, or they will never do well. Half-hardy annuals, such as *Asters*, *Marigolds*, *Phlox Drummondii*, *Stocks*, *Salpiglossis*, and *Zinnias*, and also *Balsams*, although the latter are usually classed as tender annuals, may be treated in the same manner, excepting that they should not be sown till April, and then not till the end of the month, unless they are sown in a frame, or under a hand-glass, or in pots placed in the window, from whence they can be planted out in May; half-hardy annuals generally comprise within each genera a large variety of colours, and have a fine effect if planted in masses. A little garden, if planted with *Asters*, *Zinnias*, or *Phlox Drummondii* will present a perfect blaze of flowers during the flowering season, and a small packet of either will be found sufficient for one season, when it is worth while to try something else for the next. About the time annuals have ceased blooming, it is a very

good time to plant biennials. These should be sown in July, in a bed apart from anything else, and about the month of October they will be in a condition to plant out in the place of annuals, which will then have passed their prime, and soon will be over. Hardy biennials, if not drawn up by being allowed to grow too thick, will give the garden a fresh and evergreen appearance during the winter, and will put forth their handsome flowers the following summer. Many of them are highly ornamental. The following are most usually grown :—Canterbury Bells, blue and white ; French Honey-suckle, crimson ; Indian Pinks, various colours ; Imperial Stocks, various ; Sweet William, various ; Scabious, various ; Wallflowers, various. It is far from advisable to have more than two or three sorts in one season. If each plant has plenty of room, they will look well and do well, but the sight of a crowd of miserable, half-starved plants, huddled together in a little garden, although common, has a discreditable and ungardenly appearance. We should observe here that such names as we have inserted apply to such things as are easily and cheaply procured, which are usually grown, and which are admitted to be highly ornamental ; yet we have named few indeed, compared to what might be named ; nor would we advise any one to confine themselves to such lists, nor, indeed, to any lists ; such flowers as one might reject, another might regard with particular favour ; and while one desires only such flowers as are usually cultivated, another may be highly interested in the common wild flowers of the meadow or the hedgerow, and each may rank high in display in both taste and judgment.

The true merit is seen in the effect, and effect is produced by skill and industry, therefore let the lords-and-ladies from the woods and the cowslip from the meadow be transferred to the little garden, and let skill and judgment be employed in the planting and management, and we guarantee *that it shall be in keeping with the true principles of horticulture*. As we before observed, the various modes of planting and arranging the shrubs or plants in a garden, and the various species of plants with which it may be furnished, are wonderfully numerous, so that laying down any cut-and-dry set of rules to be observed in arranging or furnishing a garden would be absurd ; yet it is well to know what particular plants are suitable to particular situations. All bright and free-blooming plants do best in sunny situations, and all plants valued for the beauty of their foliage should be placed in shady situations ; of the latter, ferns are conspicuous, but more of them anon. There are some few hardy plants which are remarkable for fine foliage or habit, such as *Fatium grande*, *Arum maculatum*, *Pulmonarias*, etc. ; these, with ferns, should invariably be placed in shady situations, since the direct rays of a burning sun are likely to disfigure them, which in this instance is a permanent injury, or at least one that will last till the following season. This does not apply so strictly to flowering plants, many kinds of which will bloom as well in the shade as in the sunshine, and *vice versâ*. Many little gardens may be so situated that the direct rays of the midday sun shine full upon them. In this case, if the soil is of a cool, retentive nature, there need be no fear of

planting anything. Nearly all plants will bear the heat of the sun if the roots are cool and moist; but if it be, as in most cases with which we are acquainted, that the soil is of a light, gravelly texture, there are some things which will not grow during the summer—at least not without a continued use of the watering-pot; but as this entails considerable labour, it is worth while to know what can be grown wholly or partly without it. Such situations are decidedly favourable for spring flowering bulbs, which flower at a time when the ground is sufficiently moist to support them, and the porous soil and hot sun will ripen the bulbs, and the moisture soon draining through the ground, will prevent them rotting; but during the summer months, scarlet geraniums, with a small amount of moisture, will preserve as creditable an appearance as anything, and will yield abundance of gay blossoms, where calceolarias would be burnt up, Pinks, cloves, etc., it would be almost useless to attempt to grow, but many of the evergreen herbaceous plants will thrive there, as the Sedums, for instance; but, of course, much depends upon the season, whether it be a wet or dry one.

Bedding plants give a splendid effect to a little garden, and they are subjects on which a greater share of skill and taste are employed in blending and harmonizing the colours than on any other class of plants. The following comprise what are usually grown for the purpose:—Calceolarias, yellow, brown, etc.; Cuphea platycentra, scarlet; Ageratum, blue; Anagallis, blue and red; Gaillardia, various; Gazania, yellow; Scarlet geraniums; Heliotrope, lilac; Lantanas, various; Lobelias, blue and white; Salvias, blue and scarlet; Senecio, crimson; Petunias, various; Verbenas, various. Of these, the Anagallis and Lobelias are very dwarf; Ageratums, Lantanas, and Salvias grow from two to three feet in height; and Hollyhocks, Dahlias, and Marvel of Peru grow still taller, and are only suitable where there is plenty of room. The time of planting out, all excepting Hollyhocks, is about the latter end of May; nor is it at all safe to trust them out before, as late seasons have proved. Hollyhocks are hardy, and may be treated as hardy biennials, or the offsets may be taken from old plants in the spring and planted where they are to flower. Dahlias are perennials, and make tuberous roots, which are taken up from the ground when the plants have done flowering and are cut down. The roots are then stowed away in a dry cellar or other convenient place, or buried in a dry situation beyond the reach of frost till the following April, when they are planted in a warm situation to break, when they are taken up and divided with an old knife or some such instrument, leaving one shoot to each piece of root, which plant where they are to flower. It is not safe to trust them for any length of time after planting without sticks to support them, as they are very brittle. The above mode of propagating the dahlia is most readily performed, and answers as well as any other, but where there is a hotbed a larger quantity of plants may be obtained from one root by potting it and plunging it in heat, and cutting off and striking each shoot as soon as large enough. Mirabilis or Marvel of Peru may be treated precisely in the same manner as dahlias. The ordinary bedding plants are half

hardy perennials. They are best propagated, supposing there being no other convenience, on a shady border under a hand-glass or small frame, which is not difficult to construct; or cuttings may be struck in moderate sized pots, which are half filled with soil, the cuttings put in, and a piece of glass laid over the top of the pot, thus covering them in as completely as by a hand-glass. Cuttings of almost anything may be struck in this manner, and a good substitute for a hand-glass is a large flower-pot with the bottom broken out, and a piece of glass laid in its place; the sides of this will act as shades. Any soil will do for the purpose, but if it be not very porous it should be made so with sand, care should be taken that it be made thoroughly moist before putting in the cuttings. The best time to strike all bedding plants is July and August, the ground being then a natural hotbed. Calceolarias may be as well left to September or October. To strike scarlet geraniums, all that is necessary is to plant the cuttings as we do cabbage-plants; there will be no fear of their striking root; but for verbenas, etc., a little more care is necessary, but not so much as is generally supposed. Take the cuttings rather small, insert them in moist earth by merely thrusting them down; cover them up, and leave them for the next fortnight or three weeks, and nineteen out of every twenty will be struck. They should then be potted up and kept out of doors as long as possible, when they may be kept in windows during the winter, taking care that they are not treated too tenderly, so as to be drawn up. We have often kept such things in a common frame, by merely banking earth round it thick enough to resist sharp frosts, and by well attending to the covering and uncovering with litter.

Having kept these till May, they are then planted with due regard to height and colour; the bright yellow of the calceolaria as a centre, the vivid scarlet of Tom Thumb geranium round them, these surrounded by white verbenas, and these again by blue lobelias, will harmonize together, and have a fine effect. But it is as well not to be guided by rule or precedent; our object should be to work in harmony with Nature, and yield rather to her freedom or irregularity than to our own stiff and formal designs. If the ground where bedding plants are grown is planted with bulbs, when they come off, the bulbs will flower in the spring, so that the ground will not be long bare; but bulbs, unless taken up every one or two years, are sadly in the way of digging or trenching the ground, and if the borders are kept neat and clean, and frequently stirred, they will by no means have an unsightly appearance, or they may be stuck with small boughs of evergreen to take off the bareness. Many persons have a particular passion for roses, and this beautiful and fragrant class of plants deserves all the attention it receives. There are few gardens wherein is not found a rose of some kind, from the fragrant tea-scented, to the old York and Lancaster. A little garden may be planted entirely with roses, and if rightly managed, will have a beautiful and interesting appearance during the summer months; let a few standards be planted about where the borders are widest, and let the ground be filled up with dwarf plants of China or perpetual roses, which may be procured on their own

roots, either in pots or otherwise. Another plan is to plant four foot standards for the back row, two feet standards in front of them, then again one foot standard and dwarf roses on their own roots fronting the whole; and if there be any wall or fence, climbing roses may be trained over it. In planting roses, they should never be buried deeper than they have been used to, and where they have a tendency to throw up suckers, these should be removed as fast as they appear. Roses should also be kept in form by rubbing off or stopping such shoots as are not wanted; if this is done in time, it will save the use of the knife, and is far better than allowing them to grow anyhow, and then having to cut out a great deal in the autumn or winter. Roses are very subject to the green-fly, which should be brushed off as soon as it appears. They are also injured by a sort of caterpillar which eats the young buds; these should be hunted for and destroyed, if possible, before they have done any mischief. Roses are propagated by budding, which has been so often mentioned, and the process described, as to render it needless here; they are also raised from cuttings, which root freely if taken off while young, and treated as directed for bedding plants.

A very neat method of keeping a little garden in order, is by cultivating the plants in pots. Let a certain number of dwarf hardy evergreen shrubs, and a few plants of *Chieranthus Marshallii*, evergreen candytuft, yellow alyssum, and such like evergreen herbaceous plants; these are to be plunged about the borders for the winter, the herbaceous plants being placed next the edge; then if some snowdrops, crocuses, winter aconites, hyacinths, and other bulbs, are potted, these can be plunged between them, and will flower in March and April. As soon as they are over, take them up, and plunge some spring flowering herbaceous plants such as the above-mentioned, which will flower in May; when these are over, they may give place to cinerarias, and these again to scarlet geraniums, heliotropes, pots of China asters, etc. If a succession of flowering plants can be kept up in this way, the garden will be always fresh and lively; one pot can be taken up and another dropped in its place; and thus nearly all the work may be performed in a place apart from the garden, which it is desired to keep in order. And, all things considered, this mode will take no more time or labour than any other.

DIELYTRA SPECTABILIS.



ALTHOUGH the *Dielytra* is properly classed as a spring-flowering plant, yet, if propagated by cuttings of the young shoots in the spring, and planted out in June in a sheltered situation, it will continue to throw up a succession of blooms till late in the season; it thrives best in a light rich soil, and should be plentifully supplied with water in dry weather. We once saw a bed so treated, in the front of a greenhouse, in bloom in September, and it appeared likely to continue in flower much longer, if frost did not occur. To procure

a stock of plants, a few old roots should be placed in heat in February; take off the young shoots as they advance, and strike them in a similar way to dahlias. They should afterwards have a shift, and be kept in a frame till all danger of frost is over, when they may be planted out as above.

NOTES FOR AMATEUR GARDENERS.



ASH FOR FRUIT TREES.—The following mixture is used in the gardens of the Horticultural Society in the form of a paint, and is applied every spring to the bark of every hardy fruit tree:—Two parts tenacious clay, one of lime, three-fourths of soot, soft soap, sulphur, and size, the last to make it stick the better to the branches.

PAINT FOR IRON WORK.—Mix two-thirds Stockholm tar with one-third gas tar; boil them together, and when thoroughly incorporated, apply the mixture as hot as possible. If lime is added, it hardens and thickens this paint, but renders it much more difficult to put on.

HOW TO MAKE AND USE LIQUID MANURES.—For vines, peaches, standard apple and other fruit trees, and for strong-growing edibles, such as cucumbers, celery, cabbage, etc., use one part, by weight, of cow-dung, with four parts of tepid water, or the collected drainage of the cow-house or pigstye, diluted with a similar quantity of water. Stove-plants, such as pines, forced vines, peaches, and mulberries, besides most flowering bulbs and shrubs, relish a liquid manure made of soot, in the proportion of six quarts of soot to a hogshead of water. The principal materials now used for liquid manures are to be used in the following proportions for all ordinary purposes:—Guano, dissolve fifty pounds weight in ten gallons of water, and of this strong solution, add five ounces to ten gallons of water for use; sheep's dung, one peck to thirty gallons; sulphate of ammonia, a quarter of an ounce to every gallon.

COMPOSITION FOR WOUNDS ON ROSES, ETC.—Take five-eighths of black pitch, one-eighth rosin, one-eighth tallow, one-eighth bees' wax; these should be mixed in a small pipkin, and dissolved over a slow fire. Apply it to the wounds with a brush, and it will heal them, as well as prevent their dying back.—*Jones's Gardener's Receipt Book.*

HOW TO PREPARE NAILS FOR WALL TREES.—They should be of cast-iron. Before using them, make them red-hot, and then throw them into cold linseed oil. This gives them a varnish which preserves them from rusting, and prevents the mortar of the wall sticking to them when they are drawn.—*Jones's Gardener's Receipt Book.*

SIBTHORPEA EUROPEA.—*An Old Subscriber.*—You are probably keeping your Sibthorpea too dry: it likes a peaty soil and plenty of moisture. The natural habitats of the plant are wet banks, the sides of springs, and the borders of rivulets.

PIGEON KEEPING.



BUFFON enumerates thirty varieties of the pigeon, all derived from one root—the stock dove, or common wild pigeon. All the varieties of colour and form we witness he attributes to human contrivance in crossing: as the pigeon is found in all parts of the world, some of the differences perceptible in these birds may be attributed to the variety of soil, climate, or region, which they inhabit.

The original of the pigeon genius, the stock-dove, is in its natural or wild state of a deep blue and ash colour, the breast darkened with a fine changeable green and purple; the sides of the neck of a reddish gold colour; its wings marked with two black bars, one on the quill-feathers, and the other on the covert; the back white, and the tail barred near the end with black. Some naturalists consider the ring-dove to be distinct from the common species, and the turtle-dove equally so from both. In this country, the only wild sorts are ring-doves or wood-pigeons, and turtle-doves, which are found plentifully in the southern and western countries, breeding in the woods during the spring and summer, and retiring into the deepest recesses during the winter. Abroad, they assemble in prodigious flocks; and in North America they migrate in the spring and fall in multitudes that darken the air, flight succeeding flight in one continual stream. At such seasons vast quantities are killed and preserved for use. For purposes of profit, the blue dove-house pigeon is the most common breed domesticated in this country. It is needless to describe these: we shall enumerate the fancy sorts, kept for purposes of amusement or show.

Carriers, Horsemen, and Dragoons, are bred for the purpose of travelling with messages, which they can be trained to do with extraordinary speed and accuracy, provided no accident happens to the bird on its voyage. The common pigeon partakes of the habit also; and for this reason it is very difficult to domesticate old birds in any other place than that in which they are reared; for although removed in covered baskets, it is extraordinary with what unerring instinct they will wing their way home. The feats of the carriers regularly trained for the purpose are, however, extraordinary, particularly in Eastern countries, where a constant communication is kept up between cities by this means; for instance, at present between Aleppo and other towns in Syria and Alexandria, the bird traversing in a few hours the space which it would occupy a messenger for days to travel across the desert, and thus informing Ali Pacha of the condition of his affairs in that province. A communication, principally for stock-jobbing purposes, is also kept up between the cities of Europe; but as the maintenance of the system is expensive, it is confined to a select few, principally Jews, and no very certain information ever reaches the public as to the performances of the birds. A few years ago, some matches were made, an account of which may be interesting, as showing the extraordinary speed which a pigeon is capable of, being in fact greater than that attributed to the eagle.

In July 1828, fifty-six carriers brought to London from Liege were flown from the former city at thirty-four minutes past four in the morning. One of them, called Napoleon, returned to his home at twenty-four minutes past ten the same morning, a distance of three hundred miles, having accomplished the journey in five hours and fifty minutes, being about the rate of forty-five miles an hour. The others followed in succession, and nearly all reached Liege before noon. Other matches made before and since show that the maximum speed is about the above rate, and that the bird can maintain it for several hours.

There is nothing remarkable in the appearance of the carrier or messenger pigeon; but the horseman, the most esteemed variety of which is called the *pouting horseman*, has a large distended crop, and exercises very grotesque attitudes, being besides the tamest of the pigeon species, and the most familiar with man.

The tumbler is distinguished for its peculiar form and variegated plumage, and also for the faculty of tumbling, which it exercises in the air, rising first to a great height, and in its descent performing a succession of somersets in the most extraordinary manner. There is also the fantail, or shaker, so called from the head being always in motion—a fancy pigeon. All these select sorts vary in price, but may be procured of the pigeon-fanciers about town, or from a salesman in Leadenhall Market. A very superior cock tumbler of the almond breed is even now worth four or five guineas, and thirty or forty years ago could not be purchased for five times that sum.

All pigeons, whether of the fancy or common kind, require pretty nearly the same treatment; and as the persons we are addressing would probably maintain them generally for profit as well as show, we shall describe in general terms the best mode of management. The first thing necessary, is to provide a commodious place for the reception of the stock; and this should, if convenient, be a loft or room, in preference to the cask elevated on a pole, or holes, or coops against the wall of a building. If a loft can be appropriated, there should be a hole left in the roof for entrance and egress, which should be provided with a shutter; and before the hole a small platform must be laid. The coops should be placed against the walls, two for each pair, and the whole frequently whitewashed, the floor being sanded, gravelled, constantly swept, and the dung carried away.

Next to a room, the pine end of a building well sheltered should be selected—if against a malt-house, or stable, so much the better, on account of the warmth. Instead of the holes being made close together, the following plan is recommended:—Make the apertures about twenty inches deep, and the entrance-holes about twelve inches wide, two and two, taking a space of three feet for every pair of birds. The height between the shelves in a room, or the holes in a coop, may be about two feet. Some prefer the breeding-holes entirely open in front, for greater convenience in clearing the nests; but it is better to have a small step to prevent the squabs (the young birds) from falling, as they are otherwise apt to do. Food and water should be supplied in such a way (when the birds are confined or fed in a room) as to prevent its being contaminated with their excrement; earthen pans will answer the purpose very well.

The proper food for pigeons, and the cheapest, is tares, peas, and small horse-bran, called pigeon-bran; but they will eat any sort of grain. If at liberty, they will provide green food for themselves; but if confined, they must be provided with such, and also abundance of gravel, with a little rape and canary seed occasionally. All things being arranged, the birds might be procured, and those should be young ones just fledged, but which have never essayed the wing; otherwise they will be difficult to retain. May and August are the best seasons to provide a stock of young birds (called by the trade squeakers). They begin to breed when six months old, and will, under good management, produce eight or ten couples a year. Wonderful accounts are published of the fecundity of pigeons, Stillingfleet asserting that 14,760 pigeons were produced in four years from a single pair. This may be rather an exaggerated estimate, but it is apparent that they multiply exceedingly.

The pigeon is monogamous, that is, the male attaches himself to one female; and the attachment is reciprocal—the fidelity of the dove to its mate being proverbial. In providing young ones it is not difficult, however, to match them according to the wish, provided they have not already formed their attachment. For this purpose they must be shut up together, or near and within reach of each other, and the courtship, carried on by cooing, brings about the connection in two or three days. The male is distinguished from the female bird by his superior size and forwardness of action. As the pigeon takes little care or precaution about her nest, it is necessary to make one for her, by placing a little soft hay in the hole. She lays two eggs only; and having laid one, she rests a day, then deposits another, and proceeds to sit.

The period of incubation is nineteen days from the first egg, and the labour of sitting is equally divided between the cock and hen, excepting that the hen always sits by night. Both the old birds are also equally assiduous in procuring food for and feeding the young. Should no young pigeons be produced after the lapse of a day or two beyond the time of incubation, the eggs (addled or rotten) should be removed, and a squab taken from another pair and substituted. The parents will rear this, and feed off their soft-meat upon it, which might otherwise stagnate in their crops and injure them. The soft-meat is a sort of pap secreted in the craw against the time it is required for nourishing the young. They have the power of throwing it up at will, and in feeding eject it from their own bills into those of the young ones. This kind of feeding continues about a week, after which they mix some harder food with it, and at length feed with whole grain. When the time approaches for the hen to lay again, the cock will not suffer her to rest, but drives her about until she settles on the nest, probably from an instinctive apprehension that she might drop her egg in an improper place. At the end of a month the young ones are abandoned, and left to shift for themselves. The unerring sagacity which the pigeon displays in returning to its home from a considerable distance enables it to roam over a wide district in search of food; and farmers consequently suffer greatly wherever dovecotes are established within reach of them. The powers of digestion of this bird are very great, and the con-

sumption of food consequently large. It is calculated that not less than five million bushels of corn are consumed by them in the year in Great Britain; and at seed-time they are particularly destructive, denuding whole patches of ground unless a strict watch is kept.

A person having no corn-land maintaining a dove-cote, the inhabitants of which forage upon his neighbours, can be looked upon in no other respect than a public robber; and there are statutes still existing the provisions of which enact heavy fines and punishment for destroying these birds, which are considered private property, these laws being doubtless made at the instance of landlords, who supported dove-cotes at the expense of their tenants.

The duration of a pigeon's life is reckoned to extend to twenty years, or thereabouts, and it is deemed full-aged when the wings are full of the quill-feathers. In order to attach pigeons to their home, it is usual to place some odoriferous drug about their holes; asa-fœtida appears extremely agreeable to them, and the strong scent of cummin and coriander seeds has an alluring effect. When a bird loses its mate, it is very often the case that it lures another from a distance, and this may often account for the loss of a particular pigeon. To prevent their tearing lime and mortar walls, some rubbish should be incorporated with lime and salt, or what is called a *cat*, made as follows:—Gravel or drift sand, unctuous loam, or rubbish of an old wall, or lime, a gallon of each; one pound of cummin seed, one handful of bay salt; mix with stale wine. Enclose this in jars corked or stopped, holes being punched in the side to admit the beaks of the pigeon. Rats and other vermin are apt to be troublesome if the birds are kept in a room or loft. To guard against this, a cat should be trained for the purpose of watching, which may easily be done. The entrance hole should also be so contrived as to prevent the intrusion of strange cats.

Cleanliness is essential to success in the management of pigeons, and every opportunity should be taken to whitewash the walls after each term of rearing, which will destroy fleas and other vermin. If confined, pans of water should be laid on the floor for the birds to wash, and also heaps of sand for them to wallow in. The most common disease is the scab on the back and breast, and this is contagious, and often fatal to the young birds. To cure it, make a paste of the following mixture, knead it into rolls, and when baked lay the pieces where the pigeons can peck at them:—A quarter of a pound of bay and the same of common salt, a pound of fennel seed, the same of cummin and also deb seed, and two ounces of asa-fœtida; mix up with some wheat flour and finely-worked clay.

REMINDERS FOR GARDEN WORK IN FEBRUARY.



PERENNIALS of all kinds intended for removal to places where they are to bloom should now be planted out.

BOX EDGINGS should be planted; trees, bushes, shrubs and plants for the borders or shrubbery, should be put in their places without delay; gravel walks should be formed, and all contemplated alterations should be made, for although this work can be done from November to

February in all open weather, this is a sort of closing season, and all such work delayed beyond the present month is incurring a risk.

This month, *Ranunculuses* for the June shows must be planted. The beds must be composed of half good loam, and half decomposed cow-dung well mixed; the bed should be dug out a foot deep at the beginning of the month. The most enthusiastic florists leave the soil out of the bed in a ridge on each side of it, until the 12th, when they put a layer of neat's dung two inches thick at bottom, all over, then return the soil to the bed, leave it to settle till the 14th, when they level it; draw drills three inches deep and six inches apart; the roots are gently pressed into the earth at the bottom of the drill; cover the roots an inch and a half above the crown by drawing down some of the mould into the drill.

AURICULAS should be top-dressed with rich compost, chiefly the dung of poultry well rotten into mould, and sparingly applied to them; its own weight of cow-dung also rotted; this mixed with rough sand to make water go through it, will be found a first-rate top dress. Take off the surface without bruising the roots, then fill up with the top-dressing, within a quarter of an inch of the top of the pot; water gently.

CARNATIONS and *PICOTTEES* must continue to have the same treatment as recommended for last month. Mix up some loam and cow-dung in equal quantities, lay them together in a heap, to get ready for potting off these plants in their large pots for blooming. Turn it and mix it once a week.

ROSES.—Prune one half the roses in the garden, leaving the other half a month longer to be pruned hereafter. The Chinese and climbing roses must be pruned but little, the weakly branches removed, and all their dwindling sprigs cut out, but main branches must not be shortened much. The garden kinds must be cut back very close, not leaving more than the two or three bottom eyes of the principal last year's shoots; also cut out any old wood and branches which cross one another, and are in each other's way. Plant roses, and whether they be standards or dwarfs, worked roses, or on their own roots, out of doors or in pots, cut the ends of all the roots, clean and take off all bruised portions, use strong loam and dung in equal quantities, and if the soil out of doors be not of this description, dig in some stuff of the kind with each plant; but we prefer autumn planting; do not prune newly-planted roses until you see how much of the wood will break into buds; graft roses on common stocks; if well done you will make plants of the prunings of your choice varieties.

DAHLIAS.—Set some of the most choice that you are anxious to propagate in pots of light mould, and place them in a hot-bed or cucumber frame.

ANEMONES for late bloom should be planted the same way as the *Ranunculuses*.

If you have unwisely delayed removing strawberries for new beds in the autumn, now is the only time to do it. Also clean strawberry beds, and top-dress them with decomposed dung.

The same may be said of gooseberry and currant bushes, raspberry canes, and fruit trees in general, but we direct these things to be done in autumn.

RHUBARB and *SEAKALE* may be covered for forcing with pots or boxes, and surrounded with fermenting leaves or hot stable dung.

PEAS.—Sow for a succession crop to those sown in November and last month, or if you have not sown any, sow for your first crop, not too thick nor too many, as we recommend sowing every month till July or even August; earth up any that are advancing in growth.

Sow also early beans in drills a yard apart, and the beans three inches apart in the drill.

CABBAGE.—Plant out in vacant spaces the strongest from the August seed-bed.

Sow *Radi-shes* and *Lettuce* in a sheltered situation, where they may be easily protected with litter, such as clean straw, which can be spread over them at night, and remain on them in a frost, but be taken off in the morning in mild weather.

ONIONS for SEED.—Plant out a few fine bulbs to go to seed, plant the bulbs two thirds in the ground, and a foot from each other.

TO CORRESPONDENTS.

MEDLARS.—*X. Z.*—The proper time to gather medlars is, the latter part of October or the beginning of November. We would advise their being kept in the following manner, which will effectually prevent them from acquiring that dry rotten state, to which they are so liable :—Select a dry day for the purpose, and see that none are bruised ; have them placed singly on open shelves in a cool place, and look them over once a week, and the moment one is found decaying (not ripening), remove it, as one will taint the whole. They are much affected by a minute fungus, which spreads in an incredibly short time, and destroys an immense number. By attending to these directions, this fruit will be eaten in perfection, which is seldom the case in this country. Referring to your proposed graft, we do not think that you would increase the size of your small fruit.

GLOXINIAS.—*J. D.*—Gloxinias may be grown wherever the accommodation of a greenhouse and a hot-bed frame can be had. In February, or March, the bulbs should be potted in a mixture of loam, peat, or leaf-mould and silver sand filling the pot one-third of its depth with crocks to insure a good drainage, and, placed into a lively heat of about 60°, where they may continue until the blooms are produced, receiving air and water as may appear necessary. When the first flowers are expanded, which will be about May, the plants should be taken to the greenhouse, observing to shade them from powerful sunlight, and by attention to watering will continue on nearly all the whole summer. The bulbs should be kept perfectly dry and at rest through the winter.

STOKESIA CYANEA.—*J. F. C., Leeds.*—*Stokesia cyanea* is a handsome herbaceous perennial, requiring ordinary greenhouse temperature, but will succeed very well in the open border during the summer months. It is increased by seed or by division of the roots, and naturally produces its attractive blue flowers in August. We have not made experiments with the annuals for the purpose you mention, but will bear this and your other suggestions in mind.

CUTTINGS OF IVY.—*N. C. H., Barnstable.*—Ivy will strike all through the summer, but it succeeds most readily in the spring. It should be struck in very sandy loam, and transplanted to where it is to remain. Do not be in a hurry, a month or six weeks hence will do to take the cuttings.

MISTLETOE.—*Annie, Hammersmith.*—Preserve the berries in sand until April, and then make a tongue in the bark of an apple, pear, thorn, or lime tree, and insert a berry so that the tongued bark will close down over it. Choose good positions on the trees, such as a fork in the main boughs, about eight feet from the ground. A mere slit in the bark will suffice to hold a berry, but the birds will discover the berries and eat them, unless they are covered, and the best way to protect them is to lay over the incision a tuft of moss and bind it down with a strip of bast. Mistletoe grows very slowly, and requires at least seven years to form a feature on the tree which supports it.

ROSES ON THEIR OWN ROOTS.—*J. Smith, Heyham.*—The month of April is the best time to turn out roses on their own roots, and you had better keep yours in their pots till then.

GERANIUMS WITH BLANCHED STEMS.—*Polly.*—Your geraniums are suffering from insufficient light. You must give them all the light you can, and if you can arrange to put them in a hot-bed next month, you may first prune them so as to get rid of the weakly shoots and induce a new growth of strong green foliage, but do not cut them unless you can provide heat for them.

WALNUT NOT FRUITING.—*New Subscriber.*—The walnut tree is a long time coming to a fruiting condition. While in a young state it grows vigorously for many years, when once it has taken good hold of the soil, and it is not until this exuberant growth is somewhat exhausted, and a moderate growth succeeds, that the tree begins to bear. Walnuts delight and succeed only in a deep alluvial, rich soil ; their roots spread far and deep, and as most vegetation refuses to grow beneath their shade, the proper position for them is the outside of the orchard or corner of a field ; their habit unsuits them for the garden. It is not usual to prune them. The necessity of gathering the fruit by thrashing it from the tree with poles, rendering any further pruning unnecessary, and the management of mature trees may be said to be confined to the removal of decaying limbs.



POLYSTICHUM LONCHITIS.



POLYSTICHUM LONCHITIS, the Alpine shield fern, or holly fern, is seldom seen growing wild by fern cultivators, on account of its peculiarly local and mountain habit, growing, as it does, at an elevation of one thousand to three thousand feet. It also ranks amongst our rarer British ferns, with us being only found in the fissures of rocks near the summits of the highest and bleakest mountains of our country. It is a native of Europe, generally extending even as far north as Lapland and Iceland. It is found also in North America, Kamtschatka, and Asia Minor.

The bleak, cold, exposed situations in which *Polystichum lonchitis* grows proclaim this fern to be the most hardy of the British species. It is an evergreen species. Its fronds are exceedingly rigid, and well calculated to resist the blast of those exposed mountains on which it luxuriates. The length of the frond is usually from six to eighteen inches, occasionally longer; the colour, deep green above, paler beneath. The fructification is mostly confined to the upper half of the frond, the sori being situated in a line on either side of the mid-vein, about midway between the mid-vein and the margin.

The mountain travellers occasionally meet with this plant in places difficult of access, and even where accessible, frequently most difficult to be removed from its native wilds. It is usually seen in perfection in September and October.

HARDY AND ORNAMENTAL SPRING-FLOWERING SHRUBS.



CHIMONANTHUS FRAGRANS AND *C. GRANDIFLORUS*.—Though these are not, strictly speaking, spring flowering plants, yet, from their value and interest in mid-winter, they are worthy of notice here, forming, as they do, a connecting link with plants which succeed them. They are, as is well known, adapted for wall culture, and are the only winter-flowering hardy shrubs that possess fragrant flowers; they therefore deserve a place in every garden. The blossoms are principally produced on ripened laterals and branches of the current year's growth, and fertility in these is encouraged by pruning the shoots back (but sparingly), until a proportionate number of flower-bearing branches is formed. In replenishing a lady's portable flower-basket, or a drawing-room artistic flower-vase, during the late autumn and spring months, they are worthy of a place with the forced flowers of the season, as hyacinths, lily of the valley, violets, etc.

JASMINUM NUDIFLORUM.—Besides being well adapted for early

March.

forcing, this forms a neat, ornamental hardy shrub, of medium size and spartium-like habit. It blooms at the same season as the *Chimonanthus*, producing its bright golden yellow salver-shaped blossoms in abundance.

RHODODENDRON LAURICUM ATROVIRENS.—This is the earliest flowering species of the genus, producing numerous rich purple salver-shaped flowers in February and March; it forms a compact, small, branching shrub, from one to two-and-a-half feet high, of semi-evergreen habit, with dark green leaves. Amongst American plants, requiring heath mould, this species appears a conspicuous and ornamental object.

ERICA CARNEA.—This is certainly the most valuable and interesting of hardy heaths. It flowers early, is compact and dwarf in habit, and, when grown in quantity, enlivens the American borders and beds at a season when ornament is most required. This species is well adapted for a bed or group. It also succeeds in large pots or vases, if kept cool and moist at the roots and replaced early. It is valuable for replenishing winter bouquets, especially in cool rooms. It may not, perhaps, be generally known that if half the plant or plants be covered with soil, or probably with any other light material, for a period before the flowers attain their colour, it will blanch them to such a degree as to present the appearance of a distinct pale or white variety, forming a lively contrast with the rosy-pink hue of the unblanched plants. This heath may be planted in the ordinary flower-borders, using as a substitute for peat or heath-mould, one-half finely sifted, pure unfermented leaf-mould (divested of its earthy matter), the remainder equal portions of fine river or white sand and sandy loam, well mixed. This compost should be well pressed previous to the plants being firmly planted in it.

ANDROMEDA FLORIBUNDA.—This is an exceedingly neat, compact, dwarf, evergreen shrub for the peat border. It grows from one to four feet high, and produces abundance of white bell-shaped flowers, resembling the lily of the valley in miniature; they rise conspicuously above the dark green myrtle-like foliage.

RIBES SANGUINEUM SUPERBUM.—A variety far superior to the species. Its numerous pendent racemes of richly crimson-tinted blossoms, are produced in March and April. It thrives in the commonest dry soils, but prefers a limestone substratum. A valuable ornament in front of larger shrubs.

WEIGELA ROSEA.—Perhaps the most valuable addition to hardy shrubs since the introduction of *Ribes sanguineum*. It forms a neat, middle-sized deciduous bush, with a syringa or deutzia-like habit, and produces a profusion of richly shaded rose and white funnel-shaped flowers. Its adaptation in ordinary soils and treatment will, ere long, place it in the foremost rank of ornamental plants in flower garden shrubberies.

FORSYTHIA VIRIDISSIMA.—A neat, erect, branching, deciduous shrub, from three to seven feet high, of a robust privet-like growth, with dark green serrated leaves, and long branch-like racemes of rich yellow jasmine-like flowers, diffusing a pleasing balsamic

odour. This and the last are two of the most valuable importations from China by the Horticultural Society.

PRUNUS CERASIFERA.—A hardy tree from five to twenty feet high, of neat, smooth-branching habit, ultimately ramifying into innumerable twig-like branchlets, which produce a sheet of snow-white blossom in March. This is one of the most ornamental early-flowering trees; it is well adapted for background effect in broad shrubberies. In the out-ground plantations of park scenery, when in bloom, it has also a highly picturesque effect.

DEUTZIA STAMINEA.—A small dwarf deciduous shrub, from one to three feet high; its ovate lanceolate leaves are surfaced with a whitish grey nap; it produces dense clusters of fragrant white syringa-like flowers in May. Ordinary soils suit it.

BERBERIS AQUIFOLIUM.—One of the most ornamental of dwarf evergreen shrubs, having glossy dark green leaves, surmounted by large spikes of bright yellow flowers in March and April. It loves a deep loamy soil, but has the finest effect in a tolerably deep peat bed. In shallow soils it should be planted on an east or west aspect, or in such a position as to be screened from bright sunlight. It forms admirable cover for game, and its numerous clusters of fruit, surfaced with a rich violet plum-like bloom in autumn, produce a very pretty effect.

DAPHNE ODORA.



THE great anxiety manifested now-a-days for the possession of plants that are called new, is, I fear, producing, in many instances, the effect of pushing aside some of our old plants, with which very many of the new ones are not to be compared.

Without affecting to despise novelties, or to be indifferent to subjects of the most recent introduction, I am anxious to call attention to some old and valuable, but comparatively neglected plants.

One of this description, I believe, is the *Daphne Odora*, whose claims on our notice in point of usefulness are perhaps second to none. Flowering at a time when flowers are so much wanted to enliven our conservatories, or for decorating the drawing-room, renders a good stock of it a great acquisition. I am aware that many plants might easily be enumerated, with whose gaudy appearance this is not to be set in competition; but among all the winter flowering plants with which I am acquainted, I could not point out another that would more amply repay the labours of the cultivator. And yet if you go into any place where the introduction of new plants is much attended to, the chances are you do not see it at all, and if you do, instead of it occupying the prominent place it deserves, you will generally find it pushed into some out-of-the-way corner of the greenhouse, as if it were an object totally unworthy of our care or attention. In such situations its appearance is just

March:

what might be expected from such unkind treatment—a few sickly looking leaves on the top of long straggling branches, and looking altogether as if it would say, “Give me air or I shall die.” But under the influence of more generous treatment how different its aspect—round bushy plants, with branches covered with foliage of a healthy dark green, and exhibiting fine trusses of highly fragrant flowers during the most dreary part of the year, from the end of October till the middle of February; and be it remembered, without any forcing, except the protection afforded by a cool greenhouse.

To those who would encourage the cultivation of this fine old plant, I would (in the absence of anything better) recommend the following simple mode of management, as having succeeded tolerably well at this place. As soon as the plants have done flowering, remove them to a cold pit, vinery not at work, greenhouse, or any other structure, where they can be placed in such a manner that they shall not be shaded or crowded by taller plants. In general those which have been standing in the drawing-room will have suffered in some degree from the dry, close atmosphere; more especially if they have been allowed to remain there for any length of time after having done flowering, for at that time they commence growing, and the young shoots, from want of light and air, will be drawn up weak and long jointed. This ought to be prevented by removing them before all the flowers have quite fallen off.

If the plants were properly attended to the previous summer, and the points of the shoots pinched out where the plants wanted filling up, it is not advisable at this period to resort to pruning or cutting back; as young shoots spring in abundance immediately below where the flowers were produced, and always flower much better than shoots out of older wood. But in special cases, when plants have from neglect been allowed to run up with naked stems, cutting them down to within six inches of the pot is perhaps the best way of reclaiming them. As this *Daphne* does not make very large roots, it has therefore the very desirable property of being capable of thriving in pots comparatively small for the size of the plant. Yet it is necessary about the end of March or beginning of April to ascertain if any of them require shifting, which, if properly executed, will be quite sufficient till the next spring. Old plants, however, which it is not desirable to increase much in size, will do well for two, and sometimes three years without shifting. The soil I have found to suit them best is a mixture of light turfy loam, sandy peat, and well decomposed leaf-mould, in about equal quantities, together with what is indispensable to success under any circumstances—a through drainage, to ensure a free passage for the escape of superfluous water.

After having been shifted and arranged it will be better to keep them for a short time a little closer than usual, till the roots begin to lay hold of the fresh soil; and most particularly to guard against over-watering, till the roots have found their way to the sides of the pots, otherwise the soil will become sodden, and the roots perish in consequence. As a general rule, at this stage no more water ought to be given than just sufficient to keep the plants from flagging.

They will nevertheless be very much assisted by being gently syringed mornings and evenings. About the end of May or beginning of June, the plants which were shifted in the spring may be supposed to be again well established in their pots, and growing freely ; if so, occasional waterings of weak liquid manure will very much encourage a healthy action, and enable them to form large trusses of flowers in autumn. But to old plants, with their pots pretty full of roots, liquid manure may be applied with advantage from the time they commence growing. Or, what answers a very good purpose is, a good mulching of half-decomposed cow or sheep's dung, through which all the water applied to the plants must pass, and consequently carrying with it a certain portion of the fertilizing properties of the dung to the roots ; and by preventing evaporation in some degree, will so much encourage the roots nearest the surface, that the dung at the end of a few weeks will generally be found matted by them. A practice prevails with some gardeners of placing their *Daphnes* out of doors, with other greenhouse plants, during summer ; but unless the means be at hand of protecting them from the direct rays of the sun on the hottest days of summer, and heavy, drenching rains in autumn, no advantage can be gained by adopting such a course, as they will be found to succeed much better in a pit, where shading can be easily applied when necessary, taking the lights off in the evening to give the plants the benefit of the night dews, and putting them on again in the morning, before the sun gets too powerful ; admitting plenty of air during the day, to make the plants stiff and short jointed.

If in hot, dry weather, red spider should make its appearance upon the leaves, let them be well syringed with clean water, applied with considerable force, early in the afternoon, shutting them up close for the night, to keep a moist atmosphere about them ; repeating the operation for several days in succession, and that pest will soon disappear.

By a little attention in summer, their flowering season may be very much prolonged. This is to be effected by setting aside some plants, and giving them only a partial supply of water for about six weeks, which will check rapid growth, promote the ripening process, and act on them, in some measure, as a season of rest. Then induce them, by giving copious waterings of weak, liquid manure, to make another growth in autumn, thereby causing their flowering points to be formed at a much later period than they otherwise would have been. Plants treated in this way will not commence flowering generally till some time in January, instead of the usual season, November.

The *Daphne Odora* is easily propagated by cuttings in February, planted in sandy peat, and placed in a gentle bottom-heat, with a close, humid atmosphere. The cuttings I have found to make the best plants are the tops of last year's shoots, which have flowered during the winter ; allowing that portion where the truss of flowers had dropped from to remain on the top of the cutting, which, from the number of buds formed close together around that place, will generally break from three to six young shoots ; thereby laying the

foundation of a fine handsome, bushy plant. Good plants may also be obtained by grafting on the Spurge Laurel (*Daphne Laureola*), and placing them, till a union takes place, in a similar situation to that recommended for cuttings.

If any remark I have made in this paper be the means, in the most remote degree, of drawing the attention of those who have the convenience at command of doing justice to this neglected plant, my object will be fully accomplished. Planted out in the border of a conservatory, orangery, or camellia house, it would be quite at home, and be an object of considerable interest during the whole winter; and prove invaluable to those who require nosegays at that dull season.

PRUNING OF CAPE HEATHS.



BEFORE the Heath grower has recourse to the knife, he must determine which of two objects he intends to effect—to improve the natural habit of his plant, or to induce a perfectly artificial one. By the former, he procures the greatest amount of fine blooming branches, and at the same time preserves the natural characteristics of the plants; by the latter, a beautifully symmetrical plant, with its natural character destroyed, is obtained, and with what would have been noble masses of bloom broken into a host of small spikelets. The prevailing practice of tying and clipping a plant into a perfect pyramid is, I conceive, at variance with good taste, sacrificing, as it does, in many instances, noble bearing, graceful and picturesque outline, at the shrine of unmeaning formality.

Gardeners who profess to take Nature as their preceptress would better illustrate her precepts by improving than by creating. There are many Heaths which never require the knife. Their natural disposition of growth is such that its application would mar instead of improve them. Of such may be instanced *tricolor*, *Bauksiana*, *aristata*, its varieties and allies. These are only instanced at random, to illustrate the method of growth alluded to.

They are naturally bushy and symmetrical, but without artificial formality. The *vestitas* are disposed to grow naked; they can be improved by the judicious application of the knife, but to tie and cramp them into pyramids is to destroy the noble appearance they would otherwise assume. Again, *pyramidalis*, *trossula*, *perseluta*, *Wilmorei*, *Pattersoniana*, admit of an extensive use of the knife. Some, as *cerinthoides* and its varieties, with *costata superba*, exhibit peculiarities of a growth unperceived in any others. The former is continually throwing out young shoots from its collar; stem it cannot lay claim to any. The latter throws up blooming shoots twelve or eighteen inches in height, bearing whorls of bloom at intervals of four or five inches. *Cerinthoides* can at any time be induced to form a bushy plant by cutting it down to the cycas-like protuberance at the collar. With *costata superba* little can be done besides

cutting off the blooming stalks immediately after flowering, as its disposition of growth does not admit of the use of the knife in its adult state. There are two periods of Heath pruning. In each a different object being in view, the principle of pruning must of course be varied.

In the one case the object is to form the plant; in the other, to induce it to produce bloom. The foundation of the future plant can, in the majority of cases, be formed in one season, if pruning is necessary. If the species be of the kind not admitting the knife, it will form itself; but of these we have nothing to do at present. Presuming it is well formed and full of promise for future excellence, it now arises—how can it be induced to retain the character and reward us by a rich display of bloom? When a Heath has produced its bloom for the season, it immediately commences producing wood for the next period of blooming; and as the Heath, in common with many genera to which it is allied, increases its growth in the main by the simple elongation of the growing points, or by laterals near those extremities, and as the foliage is permanently cast from the wood of more than two seasons' growth, it follows that if shoots of eight or ten inches in length are left from year to year, the appearance of the plant will be anything but pleasing after a few seasons' growth.

As soon as possible after the flowers begin to fade on the free-growing kinds, bring the knife into requisition; and in the use of it some little practice is necessary, not so much in the mere mechanical application as in judging of the most suitable way in which to apply it.

Physiology teaches us, and the theory is correct, that those parts of a plant possessing the greatest amount of fully-organized cellular tissue, or that substance from which all the several parts of a plant, including the reproductive system, derives their formation and nourishment, will produce the most perfect branches, if means are taken for their proper development. It follows that the pruning of any given shoot should take place precisely at the point exhibiting these characteristics in the highest development.

This being done, the otherwise dormant buds in the immediate vicinity of the incision will immediately start into activity, and the result will be strong and vigorous shoots, which, if left untouched, will continue to grow up to the expansion of their flower buds. In fact, a Heath can scarcely ever be said to be wholly inert; for, except when under the liberal application of the knife, when of course the system receives a partial check, it is perpetually growing. I have said, if the shoots produced after pruning are left to themselves, they will continue elongating till the flowers begin to expand. Now, in many cases, and in the formation of the formal specimens before alluded to, it is indispensable that these shoots should again be topped; the result is for every shoot which, if left untopped till after blooming, would have produced nine or twelve inches in length adorned with bloom, three or four inches each occupying its place, producing a more bushy and pyramidal plant, it is true, but far deficient in nobleness of appearance. In conclusion, I would say,

March.

never prune beyond the current season's growth; if so, the result will be puny and sterile shoots, a prey to insects, and such as will never reward you with a creditable bloom. I ought to mention that in pruning *E. mirabilis* great caution is necessary, if, indeed, it should be pruned at all; blooming, as it does, the whole season, it is apt to exhaust itself, producing blooms at the top of nearly every shoot when scarcely an inch in length.

The tendency should be checked by pinching off a portion of the flowering tops immediately they can be recognized, which is all that can be done in the way of pruning it.

In those species which never require the knife, the blooms, immediately they begin to fade, should be removed. As they are invariably produced at the points of the shoots, great care is necessary that the bud from which the future shoot is to spring is not injured or destroyed in performing the operation. The best apparatus is a sharp pair of scissors. If the bud is injured, no bloom is produced the following season.

CARNATIONS AND PICOTEES.



IN the treatment of these beautiful flowers, the amateur should first decide whether he will grow Carnations and Picotees for exhibition, or be satisfied with the beauty and ornament they will confer on his garden. This advice is founded on the fact that only the very first-rate flowers will be likely to succeed if competition is attempted, while more established and cheaper varieties will answer every purpose if the latter object is contemplated. There are few florists' flowers so precarious as these, and an expensive assortment, in the hands of a tyro, will probably fall a sacrifice to the various mischances awaiting them.

Begin, then, with hardy kinds, and as your experience increases, venture on the more delicate. I say this from having known the disappointment and vexation of taking in hand first-rate productions of this class. I purchased a set some years ago, and bestowed on them all imaginable pains, following the directions of the best writers on this subject. But I did not succeed. Some never bloomed; others bloomed badly; a few bloomed well, but produced no grass, as the young shoots to be used as pipings or layers are technically termed.

From this bad luck I became more cautious, and although now I should not fear attempting the most tender varieties, the ability has been secured by repeated failures. Nothing is easier than to give lists of show flowers, and to describe the general routine of cultivation; but I think the kinder proceeding is first to indicate the probabilities of success, that time and money may not be thrown away. I believe there is a great deal of imposition sometimes practised by the sale of young carnations imperfectly rooted, and

which, consequently, never can make healthy plants. If the layers are taken off at an early period in the autumn, and judiciously potted in sale pots, the roots will show themselves all round the pots in the spring. If this is not the case, I advise you on no account to buy such a plant, for it will not succeed. The absence of plenty of root-fibres is indicative of some obstruction or unhealthy condition of the plant, which will not exhibit its consequences until warm weather arrives, when it will dry up and die, or at least lead on a miserably stunted existence.

Carnations will look healthy, and deceive the grower during the whole winter, when there is scarcely any root at all, and therefore the rule I have laid down cannot be considered too strict. If you can get a nurseryman or some experienced friend to point out the sorts which are most hardy and productive, and can purchase well-rooted layers, you have the best chance of success, and may proceed with some hope in your labours.

The next question is, shall the flowers be grown in pots or in the open ground? The first plan is generally adopted with first-rate, and often with common flowers; but I think the practice is of very questionable utility. The advantages offered by pot-culture are, the economizing the soil, which is often very artificial in its character; the exclusion of wire-worms, which can of course be effected more certainly in a pot than in a flower-bed; and the ease with which layering can be performed, and other manipulations in reference to the plants carried on.

Now, there are disadvantages which must be balanced against these. Pots are in constant need of watching, lest they should become too dry; and yet, on the other hand, if often watered, the soil is reduced to an innutritive mass, requiring liquid manure to restore its properties; nor do the plants ever acquire the vigour in pots which they gain in the ground. As to soil, any good loam will grow Carnations well, and a small bed may easily be made of any materials which it is thought desirable to use. Wire-worms may be carefully searched for; or, what is best, never plant in soil which is pestered with them. To the novice I would recommend planting in beds, in rows two yards apart, to allow of easy access; and the plants a foot from each other.

The Carnation is very impatient of much wet, and a well-drained spot should, therefore, be chosen. For the same reason deep planting must be avoided. With these precautions, you may expect your efforts to be successful, and I hope, if you are induced to make a trial this year, you will rejoice in the beauties you have succeeded in raising.

If you prefer the pot system, let the pots be very large, with good drainage. Oyster shells are excellent for this purpose. When your plants begin to spindle up, let sticks be at once applied, and keep the shoots tied to them as the growth proceeds. Those who grow Carnations for the first time are amazed at the length of stick required by some of them. Never use one less than four feet out of the ground, and I have known some kinds exceed that height. If you intend to exhibit, a multitude of rules must be

observed, which must be deferred to a future time. But when you compete with others, or are contented with adorning your own garden, an awning must be provided when the flowers are in bloom, as their beauty is soon marred by sun and rain.

PYRAMIDAL FUCHSIAS.

BY A CORRESPONDENT.



AS the Fuchsia has now been brought to a great perfection both in shape and colour, a few remarks on the mode of culture which I have pursued may perhaps be of use to the amateur in enabling him to produce pyramidal plants as fine and in as short a time as the most experienced practical gardener. The system I adopt is as follows: I put a few old plants in a warm pit or vinery, where the temperature ranges about 55° , about the end of January or beginning of February, in order that they may have pushed out plenty of young wood by the middle of March. I then take off what cuttings I can get from each sort, preferring the shortest-jointed wood. First prepare as many four-inch pots as you may require, taking care that the pots are well drained, and the compost of a sharp, open nature—coarse brown river-sand and a little leaf-soil, well intermixed, will be found to suit very well, with about an inch of silver sand on the top, which will enable the cuttings to emit roots more freely. Water gently with a fine-rosed pot, then plunge the pots in the propagating pit, where there is a gentle, moist bottom-heat, where in the course of three weeks they will have made roots enough to stand potting off.

You may now pot off singly into three-inch pots in a light, open-sifted compost of rich loam, leaf-soil, and sand, equal parts, and if you have any bottom-heat to spare, they will be the better to be plunged into it for a day or two, to give the young roots a start. They may now be removed to a warm pit or vinery, or whatever you find most convenient, where the atmosphere is kept moist, which will ensure a strong, healthy, and vigorous growth.

When you find the pots full of roots, repot into six-inch pots, using for this shift a good rich compost of turfy loam two parts, one of old rotten cow-droppings, leaf-soil, and sand. As this will be their last shift this season, care must be taken to provide good drainage; this can be secured by putting in plenty of potsherds, with two or three bits of open turf or moss over all.

As the plants will now be pushing strongly, they must be tied to a neat stake, as they will be sending out laterals or side-shoots. As the making of these side-branches secures the formation of the plant, a little weak sheep-dung liquid manure will be found very beneficial at this period of their growth. As the first tier of laterals has made their first joint, pinch it at that; this will not only enable



SPECIMEN PYRAMID FUCHSIA.

you to have two shoots from each lateral, but will cause the leader to push away, and furnish you with plenty of side-wood. The four first tiers of laterals will be enough to pinch this season; the rest may be allowed to grow on.

They will be forming nice little plants now, so they may as well be taken to the greenhouse or conservatory, where, with a gay profusion of flowers, they will assist in keeping the house "dressy" for a short time. By the middle of November, water should be withheld gradually, in order to ripen the wood, and they may be placed in a dry cold pit, or any out-of-the-way place, such as under the greenhouse stage, for instance, where they must remain all the winter, as they will require no more attention till the end of February, when a little water may be applied sparingly to induce them to start; the knife must now be applied to cut back the side-shoots that were pinched last year, to the second joint on the wood they made after they were pinched, and a couple tiers of single shoots to the second joint, the rest to the first, and the leader to within four inches; thus you will have a pyramidal basis to work on.

Place them now in a warm vinery, and they will soon show indications of rapid growth. After they are fairly started, turn them out of their pots, and shake off all loose soil, and examine the roots; repot now in ten-inch pots, using strong fibry loam of a rich texture, old cow-dung, leaf-soil, and sand, equal parts well mixed. As stated for last season, attend well to drainage, as they will require no more pot room this season; replace them again in heat, and pinch in according to the directions laid down for last season, always aiming at having the plant broad and full at the pot, and tapering to the top. Pinching should, however, be stopped after the 1st of June, for by the middle of the month they should get a prominent place in the conservatory, where, by July, they will be the objects of greatest admiration in the house. Liquid manure must not be omitted upon any account, at least three times a week, as this is now the only thing the plant will derive its nourishment from, and will cause it to bloom right on till October, when it will be getting unsightly, and may be removed out of doors to make room for some other favourite. When cold nights set in, remove them, as before, to a cold pit, etc. No more attention will be necessary till spring, when they may be pruned and started according to the time they are wanted in bloom. They can be had in bloom, by putting a few into heat by the beginning of January, about the middle of May. Others, started accordingly, will enable you to have them in flower all the summer.

GRAVEL WALKS AND ROADS.



IN the very humid and comparatively sunless climate of England, nothing conduces more to the enjoyment of a country residence than a good, firm, and dry walk, upon the surface of which the ladies of a family can, without annoyance from dirt or damp, take their daily exercise. To be what it ought, it should be available immediately a heavy shower has ceased; and to this end it is desirable to get a hard, smooth surface, and to carry off the surface water by frequent gratings to an underground drain, not allowing it to saturate the materials of which the walk is composed, or the ground on which it rests, because in proportion to the absorbency of the materials will be the unsoundness of the walk after severe frosts. Both road-making and walk-making are frequently ill understood by those who attempt it.

In the ordinary course of proceeding, to form a road or walk, it is usual to make a deep excavation, which, when filled, as is usual, with a large and coarse gravel, becomes a receptacle for the drainage of the adjacent ground, thus securing the greatest evil which can happen, by the constant saturation of its foundation. A better plan is to raise the edges of it above the adjoining surface which keeps it dry.

It is necessary that there should be six inches in thickness of gravel, for otherwise, however firm and good the surface might be, the worms would cast through and disfigure it.

Nothing can be a worse practice than the employment of large bodies of rounded pebbles at the bottom of a road or walk.

After all, it is the native soil which carries the road, and if this is covered or roofed with materials which exclude the surface water, it will last—four inches of hard materials is sufficient; if pebbles, they should be broken so as to form a compact, solid body, which they do when angular. Rounded pebbles, independently of the facilities which their interstices afford for the lodgment of water, are ever rising upwards; when pressed upon any point of their circumference, they move and become wedged by the falling of finer materials around them; and as this is always going on, in time they get to the surface, making it rough and uneven. In no instance should any great amount of convexity be given to the surface of a walk; its crown should not be raised above the level of the margins. If the water will just fall to the sides where the gratings are placed, it is all that is necessary. Its outline cannot be too accurately defined; it is avowedly a work of art, and should have the impress of the nicest artistical execution in all its details.

However good the material which forms the face of the walk may be, the action of the atmosphere, alternate frosts and rain, will in time decompose the surface, in the same manner as it decomposes the hardest rocks, and by its slow but sure agency effects vast changes in the surface of the earth. The particles of earth absorb water, they expand by freezing, and when they thaw become soft and friable, presenting a fit nidus for lichens, mosses, etc., to vege-

tate in ; but with a well-made walk we have only to scatter a little bright and fresh gravel on the surface, previously loosening it slightly, and it is restored to its former beauty. I have long discontinued the old practice of breaking up the walks deeply ; and the more ancient one of leaving them roughly broken and exposed to the frosts, snows, and rains of winter cannot be too highly deprecated.

Asphalte and paving have both been recommended for forming garden walks, but I think there are few persons who would not prefer the bright warm colour of good gravel, where it can be procured. I have been in the habit of forming a sort of concrete with the gravel we get here, which answers well ; it is well watered and rolled to the consistency of puddle when wet ; it is afterwards allowed to dry, and sets as hard as a rock, the first shower of rain restoring it to its natural appearance.

Walk-making, if well done, is very expensive, of course varying with the facility of obtaining fit materials ; so much depends on their proximity to the scene of operations, or having to be carted from a distance, that perhaps no two places would come under the same estimate. Both walks and roads should be made upon the same principle—that of preserving a moderately thick stratum of angular materials from absorbing the surface water ; and yet so little is this understood that thousands of tons of stone are yearly thrown into deep trenches, to form, as it is supposed, the foundations for roads and walks, while at the same time they, instead of supporting them, secure the most effectual means of making them unstable and rotten. Let a dry surface be obtained—if not naturally, artificially ; and cover it with a thin coat of such material as will keep it so.

In the present depressed state of the agricultural interest, this may be worth the consideration of such of our friends of that class as purpose making roads ; because, the principle admitted, must cause a much less quantity of ponderous materials to be procured and hauled than is usually done in forming farm roads ; and as economy is the order of the day, this is one item in which a saving of outlay may be made where such labour is necessary. Whether it be in an approach road to the residence of a gentleman, or upon his farm, or in his garden, nothing is more satisfactory than well-kept roads and walks.

In the wilder scenes of nature we can admire rugged and irregular paths, but in what immediately relates to the comfort and enjoyment of the family of the man of wealth and taste, we look for perfection, as far as it is attainable by human means.

PANSIES IN POTS.



THOSE who have never tried to cultivate the Pansy in this way have little idea what a profusion of really gay flowers is produced by this plant during the whole of the early months; and with proper attention they will blossom in good character till the latter part of May. As regards cultivation, little need be said, for the Pansy is not difficult to manage. Plants for early flowering should be potted up from the open ground in October. If the weather is open in the last week in January or the first week in February, begin to re-pot generally, using soil consisting of good decomposed turfy loam, rotten manure, a little leaf-mould, and coarse sand, the latter in proportion to the nature of the loam. The soil should not be pressed hard with the hand; no water should be given for a day or two after potting. Before, as well as after, this operation, the plants must be kept well up to the glass. They should have from two to six shoots, or strong leaders; and to keep them to these chosen shoots, a number of small ones must from time to time be removed. These cuttings answer the double purpose of strengthening the main shoots, and producing a stock of young plants, which will supply the place of the old ones when worn out. Keep the frames in which they are placed open whenever the weather is favourable, pulling the lights back, or tilting them up. Maintain the plants in a growing state by watering them as often as they require it, going over them for this purpose every day. Plants that have several shoots should be tied into shape, placing the centre branch upright in the middle, and the remainder at equal distances all round, but the plant must be shaped according to the number of shoots; three leading branches are sufficient if cut blooms only are required. Another advantage is, that the same plants, from the succession of bloom they produce, will answer the double purpose of exhibiting in pots or stands of cut flowers.

After potting, as above recommended, has taken place, take the earliest opportunity at which the ground is in a fit state, to plant out any stock not required to bloom under glass, or plants that have been wintered in stores, etc., which will bloom through May or June, and produce a stock of good healthy cuttings. By following the simple and inexpensive treatment just recommended, I am sure that those who take the little trouble that it entails will not fail to be gratified by a fine display of bloom, which, from its long continuance, will most certainly afford much gratification.

PLANTING RANUNCULUSES.



THE last fortnight in February and the first fortnight in March make the month within which the *Ranunculus* should be planted. Florists, as a class, are distinguished for forethought, and hence it may be assumed that not only the locality for this floral gem has been allotted in the garden, but the necessary compost prepared. The formation of the beds is properly the work of autumn, and the soil should not be disturbed at this season more than about two inches deep; but if in any case this operation has been neglected, loam of tenacious, but not clayey, texture should be procured, and mixed with half the quantity of decomposed cow or horse manure; and with this the beds should be made up one foot in depth. The top layer, of two inches thickness, should be free from fresh manure. Vegetable is to be preferred to animal manure for this stratum, if added just previous to planting. The beds should be level, not rising more than an inch above the path, unless the soil be heavy and the subsoil cold, in which case a greater elevation is admissible. Three feet to three feet four inches will be found a convenient width. For planting varieties under name on a small scale, margin-boards of three-quarters of an inch in width, painted lead colour, and numbered progressively with white paint, will be found the most secure, and at the same time a neat arrangement, laths of any kind being more liable to disturbance, accidents, or loss. A scale of the bed must, of course, be made and registered. The making of *two* copies will commend itself to the judgment of the prudent, as the loss of one, when the only one, has often been the source of irremediable and protracted annoyance to the connoisseur. *Ranunculus* roots (or, more properly tubers) may be planted in drills, one inch and a half in depth, drawn longitudinally in the bed for mixtures, and transversely for named varieties. The rows should be arranged to allow the tubers to be about five inches asunder each way, or six inches by five may be preferable, as an increase of width from row to row one way of the bed, either transversely or from end to end, will have the advantage of room for applying a top-dressing or water, in subsequent stages of culture. The tubers should be placed rather firmly (claws downward) in the soil, and a knowledge of this fact has led to the origination of many contrivances in the shape of dibbles; but drilling possesses some advantages over dibbling, as, with proper attention, the required firmness of compost round the roots may be obtained, and greater facility be afforded in a drill for placing the tubers correctly, and without danger of injuring or fracturing the claws. After depositing the tubers, rake the beds quite level; and if drying winds prevail, so that the fine surface become very dry, a gentle pressure of the soil will be useful. Prepare a compost for future top-dressing. Good loam, the top-spit of a fat pasture, and decayed stable manure, or, if the soil be light, old cow-dung, in equal parts, will be suitable for the purpose.

LASTREA DILATATA.



THIS very handsome sub-evergreen fernery plant, commonly called the broad prickly-toothed buckler fern, requires no skill in its cultivation, preferring a shady situation and decayed leaves, yet growing well in any kind of soil. In woods of many years' standing, where the subsoil is a cold clay, the roots spread themselves in the decayed leaves close to the surface, so that the plants can be removed by merely pulling at the fronds. It is commonly found in the English counties of Sussex, Surrey, Essex, Oxfordshire, Norfolk, Northamptonshire, Cambridgeshire, Warwickshire, Gloucestershire, Monmouthshire, Worcestershire, Herefordshire, Cheshire, Staffordshire, Shropshire, Lincolnshire, Nottinghamshire, Derbyshire, Leicestershire, Lancashire, Yorkshire, Westmoreland, Durham, Cumberland, Northumberland, Cornwall, Devonshire, Somersetshire, Hampshire, and Wiltshire. In Wales it is found in Denbighshire, Flintshire, Merionethshire, Carnarvonshire, Pembrokeshire, Cardiganshire, Glamorganshire, Radnorshire, and Brecknockshire. In Scotland it is generally distributed through Dumfriesshire, Lanarkshire, Roxburghshire, Berwickshire, Edinburghshire, Morayshire, Inverness-shire, Banffshire, Kincardineshire, Aberdeenshire, Forfarshire, Perthshire, Stirlingshire, Clackmannanshire, Kinross-shire, Dumbartonshire, Fifeshire, Argyleshire, Ross-shire, and Sutherlandshire. It is also found in the Channel Islands, and it is a native also of America and Canada, whilst it is generally distributed through Europe, being found in Lapland, Norway, Spain, Portugal, the Alps, Italy, France, Germany, and Switzerland. It occurs at every elevation, from the sea level to upwards of three thousand six hundred feet in height. The fronds vary from twelve inches to six feet in length, and from four to eighteen inches in breadth.

EXHIBITION ROSES.

(Extracted from Mr. Shirley Hibberd's "*Amateur's Rose Book.*" *)



WHEN the judges retire from within the ropes, and the eager crowd rushes past the wavering policemen, and the tables are stormed, and the ladies win all the front places, and those who have not lost their hands are busy with notebooks, and from every wave of the great crowd arise splashes of sound resembling such words as "Wonderful!" "Surprising!" "Delightful!" and "Are they real?" "Yes, they are *indeed* roses!"—when these things occur you may conclude you are at a rose show, and perhaps the first question you will ask your-

* "The Amateur's Rose Book." By Shirley Hibberd. Crown 8vo, cloth, illustrated with coloured plates, price 6s. Groombridge and Sons, 5, Paternoster Row, London.

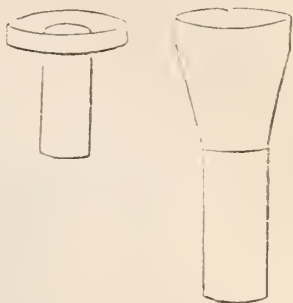
self or somebody else is, "By what magical means are such glorious flowers produced?"

The magical means comprise careful selection, honest cultivation, and tasteful disposal of the flowers. To succeed as an exhibitor the amateur must put his heart into his work, must master all the details of planting, pruning, and budding, and train his eye by constant observation and comparison to the appreciation of the distinctive qualities of the flowers, as well as the modes of procedure followed by different cultivators. How far a good soil aids the exhibitor may be estimated by the relative success of a certain few of the most eminent trade growers. It would not be prudent to mention names, but we may properly suggest that those who most frequently and continuously take the highest awards—the gold cups and medals for 96 or 72, three trusses of each, say from 200 to 300 specimen flowers in one lot at one time—the folks who have longest and loudest held a lead in this way, always hail from a strong soil, and are generally found to be great in growing roses on the English brier. Others who follow them closely, or, while showing well in certain extra classes, carefully abstain from competing in the sections where both quantity and quality are required, will be found to be located on gravelly or sandy soil, and to be assiduous cultivators of the Italian brier. The amateur must always bear in mind that a genial climate, a rich mellow soil, and a considerable amount of moisture both in the earth and the air, are the needful aids to skilful manipulation; and although he may not be able to command any of them as the accidents of locality, he must do all that art suggests as possible to remedy the defects of nature—that is, if he hopes to succeed with roses.

In presenting the queen of flowers in a competitive exhibition, considerable *finesse* is required. You may have superb roses, but unless you show them properly they will be lost, and flowers of inferior shape and substance may win the prize over the head of yours. If exhibiting is in your mind, you must occasionally visit rose shows, and make note of the manner in which the flowers are arranged, and especially of the differences in appearance between those that win and those that lose. You will very soon learn that skilful handling of the flower has nearly as much to do with success under canvas as skilful cultivation has in the open air. Now, whatever your ideas as to how roses *should be* shown, be you content in the first instance to walk the way of the world, and conform to all established rules, taking comfort by this consideration, that there have been original thinkers in the field—aye, and men of rare sound taste, too, and yet after all they have attained to nothing better than wooden boxes covered with moss in which to stage their competitive flowers.

The regulation boxes are made of inch deal, all of the same breadth, namely, eighteen inches; all of the same height, namely, six inches at back and four in front, and of various lengths, according to the number of roses. For twenty-four roses the length is four feet; for eighteen roses, three feet; for twelve roses, two feet two inches. The twenty-four box is the largest, and for convenience of carriage

is rather too large; and hence many exhibitors have a number of boxes made to hold eighteen each, and if they want to show seventy-two varieties, they put four boxes in a row, and cover the whole with moss, and so make one continuous bed of the whole. The boxes should have covers one inch larger every way, and inside, all round, should have a narrow beading half an inch from the bottom of the lid; this will rest on the edge of the boxes, and leave space between for the roses, which cannot be too closely confined, provided solely that nothing touches them. It is necessary to have holes pierced at equal distances for the roses, and to provide zinc tubes, with moveable tops, to hold the flowers. These should be of the regulation pattern, and the best way to secure a supply is first to beg one of an exhibitor—and any exhibitor will say “Yes” on the instant—and go to a tinman for a supply, giving him the one you have begged for a model.



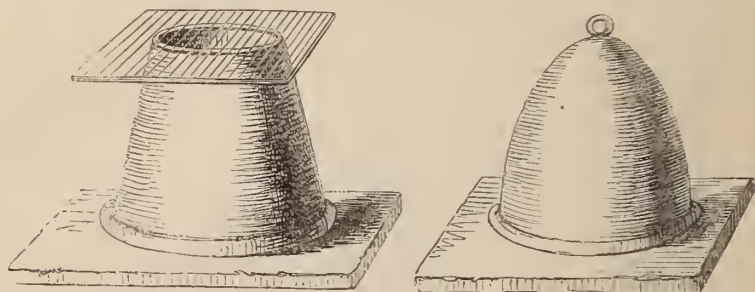
Before cutting the flowers, it is desirable to have printed or carefully written a number of neat cards bearing the names of varieties to be shown. At the last moment you will of course modify your plan more or less, and therefore you must have spare flowers and spare cards to meet all probable emergencies. The cards are

usually three inches long, and one inch wide, but you may have them smaller, provided always that the names are legible. Some exhibitors place the labels on edge in front of the roses; others insert them in neat cleft sticks which stand up slightly above the flowers. To keep the labels in lots, alphabetically arranged, is easy enough; and it is a particularly convenient way for one whose hands are likely to tremble in finally touching up the flowers preparatory to quitting the tent at one end as the judges come in at the other.



To select good flowers is of course one step towards success. For days in advance of the show you will have your eye on certain thumping buds that sit amidst buxom bright green leaves, and promise each to count one—or more than one—in the judging. Now you must be prepared with a number of wire shades eight to ten inches in diameter, and five to six inches deep, made to slide up and down a stake, and to be fixed when required by inserting a wedge in the sliding socket. Never use the shade unless you feel that it is

really required, for in dull weather delicate flowers will attain perfection without it; but if an east wind and a scorching sun, or a sou'-wester with heavy rain, prevail, the shades must be used to protect the more highly-finished flowers, and especially such as are of thin texture and light colour. The caps must be covered with fresh cabbage or rhubarb leaves, or paper. A shade may be improvised by means of a board and a flower-pot, as in the subjoined figure. The board must have a hole in the centre, and a slit cut from it to the edge to pass the stalk of the flower through. The boards will of course be firmly fixed to stakes, and the flower-pots will have their bottoms knocked out and covered with wire gauze or glass. In place of a flower-pot a bell-glass may be used.



To have cards and moss in boxes in readiness will be one good step towards achieving conquest in the strife. You will, of course, have severally thinned the buds on your best trees, especially if they stand remote from the garden in a nursery quarter, and you will have supplied with regular doses of liquid manure such of them as may have appeared to need it, taking care also not to overfeed any, lest, instead of huge *perfect* roses, they should present ugly green centres. Very well. You have next to cut the flowers. Now, the best time for this business is the morning of the show, and you cannot be too early, for the flowers will hold their own longer if you can cut them before the sun has shed one ray on their perishable petals. It is good practice to cut and stage them at once; therefore your boxes and tubes should be taken to the garden shed the night before, and your man should be encouraged to meet you on the ground at daybreak by any kind of encouragement you consider best adapted to his constitution. If he is one of the right sort, it will be enough to say, "Call me at three, Sanders, and don't cut a flower until I come."

Always cut your finest flowers first, and arrange them as you proceed, to insure a telling effect, placing the largest at the back, and putting the yellows as far apart as possible, and taking care to have light flowers at each end of the lot, and here and there in the back row to draw out the eyes of the judges, but in such a way as not to betray any strict formality. If you have but a few light flowers, and put them close together near the centre, you will spoil the very best of the dark flowers that happen to be on the outsides. Spread

the light as equally as possible, but take care to have enough about the boundary line. Always work up to your best flowers: do not use them to bring others out, but, while staging nothing but what is good, lead up by judicious arrangement of colours to your thumpers, to insure their counting their full value in the judging. A little dressing will be required as you proceed, and you will have to learn the art by practice, although in essence it is most simple, and essentially honest. You are not to stick petals into flowers that show goggle eyes, but you may cleverly clip off the decayed edge of a petal, or twitch a petal out if necessary. A very large Malmaison, not quite out, may perhaps be improved by giving it a gentle squeeze between the finger and thumb, and then the removal of the stained outside petal may make a fine flower of it. An ivory dressing-stick will be found useful. It should be the size of your middle finger, flat, and rounded at one end. If in any difficulty about obtaining it, ask a lady friend to show you the ivories employed in netting, and borrow one for practice. By deftly handling this, holding the rose at the base between the thumb and two fingers of the left hand, you may regulate the petals if they are a little disorderly, gently curling them in towards the centre.

To provide moss may prove a more difficult task than providing roses. If it is not green and bright, you will be better off without it; but as there is nothing so good as moss, you must be at some trouble to secure it if you can. The Rev. S. R. Hole recommends preparing a lining of zinc for the boxes, and in this growing the dwarf Lycopodium, *Selaginella apoda*, to form a rich green bed for the roses. But this adds to the weight of the boxes, and is finer in theory than practice. The late C. J. Perry, of Castle Bromwich—one of the truest florists and heartiest of men who has helped a show in modern times—once spoilt the look of a magnificent box of twenty-four at the Crystal Palace by bedding them on cut sprays of the common lycopodium, *Selaginella denticulata*, which had a most weedy appearance. What, then, you will ask, is a rosarian to do if he cannot obtain real moss of the proper fairy-like texture and colour? The answer is easy. Let the boxes be nicely painted and varnished a full dark green colour, and set up the flowers without moss, and every rose will appear to the judicial as well as to the public eye in its proper beauty.

When you have done all, be patient and hopeful. If you win, be not vain; if you lose, be not down-hearted; and, above all things, do not openly or inwardly abuse the judges, for remember that they perhaps know more about roses than you do, and after all they are but fallible men, and must have a margin for error in common with other people.

CLERODENDRON SPLENDENS.



HERE is hardly a more beautiful plant in cultivation than this *Clerodendron*; for, under good management, its large clusters of brilliant scarlet blossoms are produced in great profusion, and they last a long time in perfection. Unfortunately, it can never be everybody's plant, for it cannot be grown with advantage except where it can be furnished with plenty of heat and moisture during the growing season. Where there is convenience, however, it is well worth attention, and will be found to amply repay any amount of trouble which may be bestowed on it.

It may be readily propagated by cuttings made of short-jointed young shoots, selected in a rather firm state, inserted in sandy, peaty soil, covered with a bell-glass, and afforded a brisk bottom-heat. It may also be increased by grafting it on any of the stronger growing varieties; but, although this plan was at one time much recommended, it has now, I believe, fallen into disrepute, the plant having been found to do quite as well on its own roots. The young plants should be potted singly in small pots as soon as they are sufficiently rooted to bear handling, and replaced in bottom-heat, in a moist, warm situation.

When well-established, shift into other pots two sizes larger, and keep them as near the glass as is convenient, in order to induce the production of strong, short-jointed wood. And during the growing season, continue to afford them a brisk bottom-heat eighty-five or ninety degrees, with a warm, moist atmosphere, and all the light possible, merely guarding them from the direct rays of the sun on the forenoons of bright, warm days. Do not keep them growing too late in autumn, however; rather endeavour to have the cuttings rooted early in the season, so as to get strong, well-furnished plants by autumn, when they should be removed to a drier atmosphere, gradually withholding water from the soil, with a view to get the wood well ripened. And I may observe that upon this, and the plant being allowed a period of rest, future success greatly depends; for unless the wood is properly ripened, and the natural season of rest afforded, there will be no possibility of getting them to break strongly or grow vigorously; but if these particulars have been properly attended to, they will grow equally well whether started in June or March, and form splendid plants for blooming in a warm house during winter. If, however, your young plants are intended for blooming in summer, water should be gradually withheld towards the middle of October, and they may be removed to their winter quarters by the middle of November, which may be a corner of the stove, or to any dry situation, where the temperature may average from fifty to fifty-five degrees, and no water should be given to the soil during the resting season. About March turn them out of their pots, and shake away as much of the soil as can be done without injuring the stronger roots, and re-pot in not over-large pots, using good fresh turfy loam, rich fibry peat, and leaf-soil in about equal

proportions, well intermixed with plenty of sharp sand to secure rapid drainage, cutting the shoots well back to strong prominent eyes. After potting, plunge in a sharp bottom-heat, and maintain a moist atmosphere by frequent syringings, but carefully avoid over-watering the soil until the plants fairly start into growth.

The shoots may be loosely trained to stakes until the plants can be shifted into their flowering-pots, when light wire trellises may be applied, so as to enable them to be kept neatly and regularly tied. There is no danger of over-potting a plant like this, for with good management, plenty of light, and the command of heat and moisture, it will fill a 20-inch pot, and form an immense specimen in the course of a few months, or it will bloom nicely in a 12-inch pot, forming a handsome, moderate-sized plant. Therefore, the size of the flowering-pot may be regulated by circumstances, the only difference being that the plants will bloom earlier, and their beauty will be shorter lived in small pots, and *vice versa*. If a large shift is given, however, be very careful not to give too much water to the soil until the roots reach the sides of the pot, and when this is the case a liberal supply of clear manure water should be administered. Keep the shoots regularly trained to the trellis, and continue to keep up a brisk bottom-heat, with a warm, moist, humid atmosphere, until they are fairly in bloom, when they may be gradually prepared for removal to the show-house; and if this is done carefully, and they are afforded a close corner not exposed to draughts, they will continue to unfold their brilliant flowers for a very long period. By taking care to get the wood well ripened, affording the plants a period of rest, and disrooting, etc., as recommended above, the specimens will last for any number of years.

NEW BOOK.

The Amateur's Kitchen Garden, Frame Ground, and Forcing Pit.
By SHIRLEY HIBBERD. London: Groombridge and Sons.



IT is hardly allowable for us to express an opinion on the merits of this volume; which we are sure will be welcomed by very many of our readers, but with the view of explaining the object and scope of the book, we quote the opinion formed of it by our clever and practical contemporary, "The Journal of Horticulture":—

"This volume forms part of a series of gardening books for amateurs which the author has from time to time produced, and which have met with a considerable amount of public favour. This is certainly not the least useful of the series; it is also attractive, for it is well printed on toned paper, and contains plans, diagrams, and illustrations elucidatory of the text, and also a few too highly coloured plates. These were, perhaps, included, with the object of lightening the subject-matter of the book, which the title might suggest as being somewhat heavy. Kitchen gardening is proverbially hard work. It consists largely of digging, trenching, and

manuring; and while such branches of practice are thoroughly described, they are not treated in a manner so as to produce the backache in reading about them. The book is not by any means dull and dry, but is such as an amateur gardener might rest over—that is, read with pleasure even when fatigued after a hard day's labour. In this respect it differs advantageously from the usual style of kitchen-gardening books which are rather profusely issued from the press; yet while the style is free and pleasant, the practice detailed is sound.

“ Besides treating briefly on the principles of kitchen gardening, such as site, form, character of soil, etc., there are chapters on pits and frames, protecting, soils, manures, and the cultivation suited to crops of vegetables, herbs, and fruits usually found in moderate-sized gardens. These chapters are concise, and the instructions given are explicit. The selections of varieties are judicious, and far superior to those given in a bulky volume recently issued, which was once a standard work. The author of the ‘Amateur's Kitchen Garden’ has not fallen into the common error of recommending the Mazagan Bean as the best early variety, but correctly describes it as a ‘poor thing, but early.’ We agree that it is little better than a horse bean, but have never found it so early as the Early Longpod. The author's practice on Broccoli culture having been gained in the south he has not experienced the difficulty of preserving that important crop through the winter, which is so hard to accomplish in northern districts. He has never found it necessary to lay the plants down, but he has found the value of sprinkling the ground between the plants with salt at the rate of ten or twelve bushels to the acre. Others who adopt this practice will find the value of it too, for, as the author observes, ‘it is certainly not a waste of labour or of salt, for the result is a wholesale destruction of vermin, and a consequent protection of the plants from their ravages during those mild winter and early spring days, when slugs and other such come forth in troops and eat out the hearts of the best vegetables in the garden. It is worth remembering, too, that the salt is worth its cost as manure, and its presence in the soil will benefit the next crop.’ When the author found in his trials that Snow's Winter White Broccoli was in use from April 2nd to April 16th, we think he had not the true variety, or the trials were conducted during an exceptional season. We usually cut heads of this variety in January.

“ The practical nature of the volume will be best exemplified by a few further extracts. Alluding to such necessities as walls and fences, low walls for fruit trees, which have recently been advocated in a sensational pamphlet, are rightly denounced—negatively, it is true, but none the less emphatically by the following sentence:—‘The minimum height for a wall to be of any use in fruit-growing is eight feet.’ Such a wall the author goes on to say ‘should be nine inches thick, and have a coping projecting forwards. If from eight to fourteen feet the thickness should be thirteen and a half inches, and the coping six to eight inches. If from fourteen to twenty feet the thickness must be eighteen inches, and the coping should project

at least a foot. Hollow walls are formed by placing the bricks on edge alternately with their faces and ends outside, so that every second brick is a tie, and every course alternates in the order of facings, so that every end comes over and under a full face. By this means a nine-inch wall of great strength is obtained, and a considerable saving of bricks is effected.

“When a live fence is preferred to a wall, the question will arise, What shall it be? Thorn is the quickest and cheapest, and if well arranged makes an effectual fence, but it is not well adapted for a garden. Common Privet soon makes a dense evergreen boundary, useful alike for shelter and to impose a check on thieves, especially when it obtains a height of six or seven feet. The beautiful large-leaved Privet, *Ligustrum ovalifolium*, is as fast-growing and handsome a plant as can be used for a garden fence, and will cost but little more than the common Privet. Everybody knows that Holly is the finest of all boundary plants, but it should never be planted by a tenant at will unless the landlord is willing to pay for it, and in every case it will require the growth of years to thicken into a barrier and make a fair return for the money and labour invested in it. For general purposes common Privet is the very best of boundary plants for enclosing a garden, for it is not only evergreen and grows as close as a mat if planted thick enough, but it soon gets up to a useful height, so that no one can see through or over it.’

“The subject of edgings for walks and borders is admittedly a perplexing one to many amateurs, and, as the author sagely remarks, ‘one way out of the difficulty is to do without edgings’; but he does not leave the matter there. After a favourable word for the good and well-tried Box edging, and an unfavourable one for many edging tiles, which ‘split into fragments after hard frost,’ he says, ‘There cannot be a doubt that in a majority of cases a plank on edge fixed to posts driven down at distances of eight feet or so, is the best possible edging for a kitchen garden. The paltry lath sort of stuff we sometimes see is not to be considered plank on edge. We want planks one inch thick and four to nine inches broad, and they should not be sunk into the ground at all, but the border should be made up to them. The top edge may be rounded, and that is all the fine art possible, unless it is determined to pitch or paint them. Finally, a substantial stone moulding is the proper thing, and happy, in one sense at least, are those who can afford it.’

“The practice of growing fruit and vegetables on the same plot of ground is described as a mistake because it is unprofitable, and a variety of modes of associating these two branches of gardening are suggested; but fruit trees on lawns and in shrubberies are not considered incompatible. On this subject, which is now receiving the attention of our readers, we cite the following:—‘It must be understood at starting, that while some kinds of fruit are decidedly ornamental, others are as decidedly not so. All the most valuable household fruits—Apples, Pears, Cherries, and Plums are decidedly ornamental, and adapted to embellish the lawn and shrubbery, and give shade to the summer house and the croquet ground. There are several kinds not usually regarded as proper to the fruit garden that

would be both useful and ornamental, as, for example, the Siberian Crab, which is one of the most beautiful of trees, and its pretty fruit makes a good preserve. All the varieties of Nuts are handsome, and make nice lovers' walks. For particular positions the Purple-leaved Filbert is well adapted, the leafage being of a rich bronzy-green colour, and the nuts of excellent quality. Those who wish for ornamental trees that will contribute to the comfort of the household may easily find them, and we are quite sure no one will dispute the proposition that decorative horticulture might derive considerable aid from the trees and shrubs that belong technically to the fruit garden.'

"The closing chapter is headed, 'Reminders of Monthly Work.' The twelve articles are as they should be, short, and are interspersed with seasonable hints. We recommend the book as one from which amateurs and even professional gardeners may derive reliable information, which is the more acceptable as it is conveyed in an entertaining manner."

NOTES FOR AMATEURS.



HOW TO PRUNE FRUIT TREES.—With regard to pruning pears and apples, to ensure bloom-buds and to check too luxuriant growth every side-shoot, or at least all that are not required to be left to increase the size of the tree, should be shortened to about six or eight inches, beginning about the end of July and at the top of the tree (this is important), taking off about one-third the way down; then in about five or six days prune the second part, which is the middle of the tree, and finally the third or lower part of the tree in five or six days after the second pruning, and in the winter a final pruning of all these shoots to the fruit buds.

HOW TO PREVENT DUMPINESS IN HYACINTH SPIKES.—Long before they bloom you will have to note how the flower-stem pushes, for it is a common defect of even good hyacinths, and especially those first forced, to come dumpy, the bloom close to the crown, so that the leaves overtop the blossom as if the latter were ashamed of itself. This is easily prevented, though some plants refuse improvement. Make a number of funnels of stout brown paper, or even common newspaper, each funnel to be from six to nine inches long, and sufficiently wide to include the bulb and a portion of the soil, or, if in glasses, to fit outside the upper rim of the glass. The funnels are to be shaped like those in which grocers put sugar, but instead of the narrow end being brought to a point, it must be left open to the extent of half an inch or so. If made grocer-fashion, they may be pasted up, and when dry cut at each end to fit neatly and admit light only at the top. This will seldom fail to coax the flower-stem upwards. As soon as the flower-stem is long enough, remove the funnel. For the early-forced flowers, this plan is essential to the perfect development of the flower."—*Hilberd's Garden Favourites.*

TIE FOR STANDARD ROSES.—The best and simplest is that invented by Mr. Wilkinson, nurseryman, of Ealing; it makes a capital strong neat tie, and the plant is thoroughly secured. It is merely a band of soaked straw, tied with strong string between the plant and the stake, and again at the back of the stake.

VARNISH FOR RUSTIC SEATS.—One quart of boiled linseed oil and two ounces of asphaltum, to be boiled on a slow fire till the asphaltum is dissolved, being kept stirred to prevent it boiling over. This gives a fine, dark oak colour, is not sticky, and looks well for a year. Or, first wash the furniture with soap and water, and when dry, on a sunny day, do it over with common boiled linseed oil; leave that to dry a day or two, then varnish it over once or twice with hard varnish. If well done, this will last for years, and prevent annoyance from insects.

HOW TO TURN PLANTS OUT OF POTS.—Open a hole with a trowel, and drop the pot into it, level with the general surface, and fill round the pot so as to imbed it neatly, pressing the earth to it with the hand, just as if the pot with the plant in it were to remain there. Then give the pot a twist round and lift it out, and there will remain a clear firm hole, ready for the ball that is to be dropped into it. Place two or three fingers of the left hand on the soil of the pot, make the palm of the hand into a hollow, so as not to break the tender plant, turn the pot up, give the rim a gentle tap on the side of the wheelbarrow, and *presto!* you will have the ball neat and complete in your hand, and have only to turn it over neatly into the hole, which it fits exactly. Dress the earth up to it, and you will have planted it without hurting the tenderest spongiolate of its many juvenile roots. In re-potting and bedding out, whenever you wish to keep the ball entire, proceed in the same way, and you will never have an accident. When all are planted gather up the pots and *take care of them*, another rule applicable to bedding generally; give a good watering, and the next day rake the surface over, and make all neat and tidy.

GARDENER'S BOOTS TO WATERPROOF.—A pint of boiled linseed oil, half a pound of mutton suet, six ounces of clean bees'-wax, and four ounces of resin, are to be melted and well mixed over a fire. Of this, while warm, but not hot enough to shrink the leather, with a brush lay on plentifully over new boots and shoes, when quite dry and clean. The leather remains pliant. The New England fishermen preserve their boots water-tight by this method, which, it is said, has been in use among them above one hundred years. They can thus stand in water hour after hour without inconvenience.

CRICKETS TO POISON.—Take one pint of oatmeal and two ounces of arsenic, together with a little ground aniseed and caraway seed, mixed with it. This should be laid on pieces of paper, in convenient places for the crickets to partake of it. Also arsenic and honey may be mixed together and laid about for them in the same way; but they will most readily partake of the former.

ANOTHER.—Equal parts of gravel, well screened, and clean river or pit sand. With five parts of the mixture of gravel and sand, mix one part of Portland cement. Mix with water, and apply two inches thick.

HOW TO MAKE WATERPROOF WALKS.—The ground must be previously levelled, then put on it a coat of tar, and sift some road sand or coal-ashes all over it very thickly; after this is dry repeat the operation until you have got four coats of tar, and as many of coal-ashes or road sand. You will then have an excellent clean, dry, hard path. It will make excellent *walks*, or floors for sheds, out-buildings, &c., and will wear for many years.

CANARY BIRDS.



HE plumage, pretty form, and docility; the charming familiarity which disposes it to nestle without fear or reserve beside us; and, above all, its melodious song, have long introduced the canary to all classes of society. Buffon, speaking of this beautiful and universal favourite, says: "If the nightingale is the chantress of the woods, the canary is the musician of the chamber; the first owes all to nature, the second something to art. With less strength of organ, less compass of voice, and less variety of note, the canary has a better ear, greater facility of imitation, and a more retentive memory; and, as the difference of genius, especially among the lower animals, depends in a great measure on the perfection of their senses, the canary, whose organ of hearing is more susceptible of receiving and retaining foreign impressions, becomes more social, tame, and familiar; is capable of gratitude and even of attachment; its caresses are endearing, its little humours innocent, and its anger neither hurts nor offends. Its education is easy; we rear it with pleasure, because we are able to instruct it. It leaves the melody of its own natural note, to listen to the melody of our voices and instruments. It applauds, it accompanies us, and repays the pleasure it receives with interest; while the nightingale, more proud of its talent, seems desirous of preserving it in all its purity, at least it appears to attach very little to ours, and it is with great difficulty it can be taught any of our airs. The canary can speak and whistle; the nightingale despises words, as well as our airs, and never fails to return to its own wild wood notes. Its pipe is a masterpiece of nature, which human art can neither alter nor improve; while that of the canary is a model of more pliant materials, which we can mould at pleasure; and therefore it contributes in a much greater degree to the comforts of society. It sings at all seasons, cheers us in the dullest weather, and adds to our happiness by amusing the young and delighting the recluse, charming the tediousness of the cloister, and gladdening the soul of the innocent and captive."

We think we shall be rendering an acceptable service to many of our readers by giving a few plain directions for the treatment of these pretty warblers; for which we are chiefly indebted to a useful, though little-appreciated work, entitled, "*Cage Birds*," by Dr. Bechstein, and which our own experience has shown to be judicious.

Except in the breeding season, the male canaries should be kept alone in separate cages, which, whatever the shape, ought not to be less than eight inches in diameter and a foot in height, with two sticks placed across for the birds to perch on. The females may be allowed to range the room with one wing clipped, or, which is better, kept in large cages; where, from having plenty of exercise, their health and strength are better preserved. In the small cages, glass vases should be placed on the outside, at the extremities of the lower stick, to hold the food and water.

These may be surmounted with a cap of tin, or something of the kind, to prevent the seed from being so easily scattered. Cleanliness being a great preservative against most of their disorders, the bottom of the cage should be made to draw out, that it may more easily be cleaned and covered with sand. This should be done every day, or at least several times a week.

These tender birds, being natives of a warm climate, and becoming more delicate instead of hardier from being kept in the house, require a temperature analogous to that of their native climate. They must be protected from the cold, and never allowed to remain in winter in a cold room, which would occasion many diseases, or even death. But in summer it is proper to place them in the open air, and they enjoy it very much. Never do they sing so gaily as on fine days, and their cages should therefore be placed at the open window, that they may have the advantage of the light and heat of the sun, which is particularly serviceable to them while bathing.

Their food is an important point; for in proportion as it is simple and natural, it will be wholesome; and, on the contrary, the more it is mixed and rare, the more injurious and productive of disease will it be. What we have found the best is summer rape-seed; we mean that which is sown at the end of spring, which is small and brown, in distinction from the winter rape-seed, which is sown in the autumn, and which is large and black. This seed alone agrees with canaries as well as linnets; but to give them the pleasure of variety, a little bruised hemp, or canary, or poppy-seed is added to it, especially in the spring, when they are intended to breed. Indeed, a mixture of rape-seed, oatmeal, and millet, or canary-seed may be given to them as a great treat. But whatever seeds they may have, they equally require green foods, as chickweed in spring, lettuce and radish-leaves in summer, endive, water-cress, and slices of sweet apple in winter. As to that whimsical and complicated mixture, prescribed and used by many people, of rape, millet, hemp, canary-seed, maize, sugar, cake, hard biscuit, cracknels, buns, and the like, so far from being wholesome, it injures the birds in every respect. It spoils their taste, weakens their stomachs, renders them feeble, sickly, and incapable of bearing moulting, under which they most frequently die. It is true that they may be accustomed to eat everything which comes to table; but to teach this habit is also to prepare a poison for them, which, though slow, is not the less sure, and brings them to a premature death; whilst every day we see bird-fanciers, who are poor, who

hardly know the names of these delicacies, rear, on the simplest food, a considerable number of the healthiest, cleverest, and strongest canaries.

We must, however, be guided in a great measure by the constitution of the birds. They should be daily supplied with fresh water, as well for drinking as bathing, in which they delight. In the moulting season, a nail or bit of iron should be put into the water, in order to strengthen the stomach. Saffron and liquorice are in this case more hurtful than useful. Grains of the sand with which the bottom of the cage is strewed, afford the birds a help to digestion.

REMINDERS FOR GARDEN WORK IN MARCH.



HYDRANTHEMUMS should be parted and planted out in beds or borders, that they may be got into a growing state before the season for striking their tops, or be flowered as they stand.

AURICULAS will begin to grow fast, and unless you are particularly in want of increase, you will strengthen the bloom by taking off the side-shoots small; they greatly retard the main bloom if permitted to grow on the plant; they may have the benefit of warm showers occasionally, if there be such during the month, but they must be shut up and housed at night.

CARNATIONS, PICOTEES, PINKS, PANSIES, HYACINTHS, TULIPS, and bulbs in general, must have the treatment already recommended continued through the present month. Hardy Annuals may be sown in the borders.

DAHLIAS.—Take off cuttings from those already in heat, cut them close up to a joint or under side of a leaf; put one cutting each into the smallest No. 60 pots, and place them into the hot-bed to strike.

GRAFTING.—The middle of this month is a good time to begin grafting, and as it is easy to get a piece of any good pear, apple, plum, cherry, peach, apricot, nectarine, or other fruit, you may cut down any other less valuable tree of the kind. All you have to do is to cut both the stock and the graft to fit each other, tie them well to secure them, and put clay or grafting wax over them to keep the air out. The wax is made with resin and bees'-wax, equal parts, and a little common tallow to soften it. It should be hard when cold, and melt at a low temperature; it should be laid on with a brush. The best methods of grafting were described in the February Number.

WALL FRUIT.—We have no faith in protecting ordinary wall fruit trees in bloom, but for those who have, now is the time trees require it most.

CLEARING the ground among all sorts of crops and young trees is a necessary duty at this time.

Sow a few **EARLY TURNIPS** in a warm sheltered situation, and if there be any continuance of dry weather, they must be watered.

POTATOES.—Plant a few potatoes, whole sets of moderate size and early kinds. If you have any well-rotted dung, dig trenches eight inches deep, two feet apart, put dung three or four inches thick in the trenches, and the potatoes upon them, draw down earth upon them to cover them well three inches. These are for an early crop.

BEANS.—Plant out from the seed-beds in rows two feet apart, and the plants about four inches apart in the rows.

RADISHES.—Continue to sow a few, if they are required to succeed those sown last month.

HORSE-RADISH.—Cut horse-radish into pieces an inch long, trench the ground fifteen inches deep, place these cuttings in the trenches as you make them, six inches apart, and cover up with the soil which you take out of the next trench. It is a vulgar notion that you are obliged to plant crowns; any inch all the way

down a stick is as good as the crown, and it is better to trench them into the ground than to make holes for them.

CARROTS.—Sow some early ones in a sheltered situation, first breaking the ground well to a spit and a half deep; rub the woolly seeds apart in some sand, and sow in drills nine inches apart from each other, covering them very lightly.

CAULIFLOWERS.—Sow some seed in a warm situation and in rich ground.

CABBAGE.—Sow some of the early sorts in a warm border or quarter.

CELERY.—Sow some seed in pots or boxes to put into a cucumber frame, and grow it for early planting, or to enable you to, in some measure, shelter it if necessary.

LEEKS.—Sow in a warm situation; a moderate patch will be sufficient for a tolerable crop when planted out.

LETTUCE may be sown, and if you have any that has stood over the winter under shelter, plant a few out.

MINT.—The roots may be dug up and parted, and fresh plantations made; some potted and put into a frame, or even into a warm room, will be found useful perhaps, especially as it in such great request.

ONIONS.—Sow for a first crop. The ground should have been laying in ridges through the winter; strong, well-decomposed manure should be plentifully dug in and mixed with the soil, which should be levelled, and the seeds sown thinly and evenly all over the bed, unless the appearance of drills be preferred. The seed must be well but not deeply covered, and well trodden or rolled in.

PEAS.—Sow more peas for a succession; the earlier sown ones already up must be cleaned and earth drawn to their stems in a ridge on the shady side of the row, and pretty high up to protect them from the cold winds; also stick those that require it as soon as possible, as it protects them from wind and frost.

BORAGE, said to be excellent for bees, may be sown wherever they are kept, and be allowed to take their chance without any other culture than clearing them from weeds.

TO CORRESPONDENTS.

RUSSIAN VIOLETS.—*J. B., Bournemouth.*—These may be divided and planted out as soon as they have done flowering. Runners make capital plants; remove them in May. A shady but not confined place is generally recommended for the Russian violet, but we have seen it thrive and bloom admirably in an exposed situation.

MUSHROOMS.—*Subscriber.*—Too much moisture, either in the atmosphere or bed, is doubtless the cause of your mushrooms rotting off soon after they appear above the surface. As to the woodlice, a toad or two kept in your house will help greatly to lessen their number.

GRAPES.—*C. S., Brixton.*—You cannot do better than plant Black Hamburg in a span-roofed greenhouse, well exposed to the morning, mid-day, and afternoon sun, but without fire-heat.

HOYA CARNOSA.—*Lucius.*—If you had space it might be worth while to preserve the seedlings, but, limited as you are as to room, we should not advise it, as it is not one seedling out of a very large number that rivals the parent plant in beauty, and *H. carnosa* itself is undoubtedly one of the best of its species. We do not recognize the other plant by the name you have given it; but we think, if its name is a guide to its species, that you could not go far wrong in treating it as you would *Primula sinensis*.

CAMELLIAS.—*J. Jones.*—Many reasons may be assigned for your camellia dropping its flower-buds, as, for instance, sudden changes of temperature, etc. A sudden rise of temperature causes them to push rapidly; on the contrary, a decrease of warmth at that time checks growth; and from both causes buds will fall. A variation of a few degrees will considerably affect them when in bloom, particularly in winter. If the soil in the pots is allowed to get dry during autumn, or after the buds are set, that will cause the plant to cast its buds; for if

Marob,

the interior of the hall has become dry during summer (which is frequently the case with large plants), all slight watering afterwards only moistens the outside of the ball. The best remedy for this is to take a blunt pointed stick and pierce holes through the centre of it, and give a good soaking of water. In your case administer a good top-dressing of fresh loam and well decayed cow dung (three parts of the former to one of the latter) just before housing for the winter, and afterwards occasionally during the winter stir the surface with a blunt pointed stick, this will keep the soil light. Allow moisture to pass through freely, and, with a little heat and moisture applied in November, most probably your flowers will expand freely; for in nearly all cases like yours, when flower-buds fall off in winter, the evil arises either from want of heat or moisture. The camellia is one of those patient plants which does not show injury for months after it has received it, unless the injury is very great indeed; for the camellia, like all true evergreens, is not actually in a state of rest at any time of the year.

LETTUCES.—*New Subscriber.*—The object of tying up lettuces is to blanch them. The outer leaves are tied over the inner ones so as to exclude the latter as much as possible from light. You must not, however, tie them up in wet weather, or the plants are apt to rot at the heart.

EARLY PEAS.—*B. C. J.*—It is doubtless a good plan to shelter early peas when growing by placing a hedge of matting, or of plaited bean sticks, or other protection between the rows, where they are much exposed to cold winds, provided the protection does not shade the plant too much.

LARKSPUR.—*W. S.*—Sow at the end of March. Thin out to six inches apart, and leave them to their fate. Do not think of raising it in heat, or transplanting it.

GLOXINIAS.—*Lady Subscriber.*—You were right in drying off your seedlings in autumn. Before starting the roots again, they should be taken out of the old soil and fresh potted in a mixture of equal parts of light sandy peat and leaf-mould, to which may be added a small portion of well-decomposed cow-dung, using plenty of drainage. Afterwards they should be placed in moist heat, and fully exposed to light. When they begin to grow, water should be given in small quantities at first, but freely both to roots and tops after the plants have become somewhat advanced.

VINE PLANTING.—*C. S. B.*—In planting your vines, spread the roots out on the surface of the border, and cover them with no more soil than will keep them firm. In order to prevent the roots from becoming dry, cover the border with litter until the plants are established.

ANNUALS.—*Jane.*—The following sown at the end of the month, in a gentle heat, will smarten up the empty shelves of your greenhouse in autumn, when your other plants are out of doors, viz.: *Rhodanthe Manglesii*, *Nemophila insignis*, *Viscaria oculata*, *Portulaca splendens* and *Thellusoni*, *Lobelia ramosa*, *Salpiglossis*, *Schizanthus retusus*, *Zinnia elegans*, *Brachycoma iberidifolia*, *Martynia fragrans*, *Clintonia pulchella*, *Mesembryanthemum (tricolor) pyropæum*, *Balsams* and *Cockscombs*, and to these may be added the *Fringed Chinese Primulas*, *Cinerarias*, and *Calceolarias*, which, if sown about the end of March, will flower in autumn.

VINE DISEASE.—*Alpha.*—The white mould which you found on the roots of your vines, in a concrete border, is probably connected with the oidium, and may have been encouraged by excessive dryness. As your vines are probably now breaking, all you can do at present is to stir the soil and introduce some lime and sulphur near the roots, and apply sulphur frequently to the vines inside the house.

SPANISH CHESTNUTS.—*Jacob.*—You should not allow your Spanish chestnuts to form more than one main stem. This can be readily managed by shortening or stopping the laterals; and if the main stem once gets the mastery, the laterals will dwindle away, or can be readily removed. If the trees are very young, then the strongest laterals may be cut clean out; but pinching the ends when growing is better, until the main stem is in full vigour of growth.





THE DAHLIA.



REGARDED from the florist's point of view, the Dahlia is one of the grandest flowers of the garden, and in rank must be placed second only to the rose. When required to form the background of a plantation, intermixed with hollyhocks, aconites, and other tall-growing plants, it is only necessary to put out in the common soil roots that have been stored in sand the first week in May, or wait until the first week in June, and then put out young plants that have been carefully hardened in a frame. The bouquet dahlias are especially valuable for the mixed border, because their comparatively small flowers are produced in great profusion, and they are more useful as cut-flowers than those of the exhibition class. When the frost has cut down the plants, the roots should be taken up with a few inches of the stem attached as a handle, and be stored away in sand in a loft or some other cool dry place. To grow the dahlia with a view to the production of fine flowers, something more must be done than this rude code requires. The roots are started into growth on a hot-bed or over a tank in a warm greenhouse in March, and if a large stock is required, the shoots are taken off and struck in heat as fast as they can be obtained. But if only a few good plants are wanted, the first lot of shoots are broken off and thrown away, and the second lot are struck; these making better plants than the first. They must be kept growing freely in the fashion of bedding plants, and be hardened off in like manner for planting out. The plantation should be made on a piece of ground that was prepared for the purpose in the previous November, by trenching and manuring. It should lie open to the south, but have the shelter of trees from the north. A shady or confined spot will not do. It is a common mistake to plant early in order to obtain extra growth and early flowers. Early planting is a needless exposure of the plants to a thousand baneful influences. The first week in June is the proper time to plant, but some time in May, and the sooner the better, the plot should be planted with lettuces, and these should be constantly hunted for vermin. The proper way to plant is to open holes five feet apart, and dig in some good rotten manure to a depth of two feet. Then plant carefully, filling in round the plant with fine earth, and drive down a strong stake behind the plant about four inches distant from it. Finally drive in two shorter and lighter stakes in front of the plant, about eighteen inches distant from the stake in the rear, to form a triangle. As soon as the plant is tall enough tie it to the main stake, and pass the matting on either side of the plant to the stakes in front to form a sort of cage. The farther tying will be a very simple matter. In dry weather copious supplies of water must be given, and by the middle of July the roots should be mulched with good half-rotten manure. The earwig will now begin to make its mark on the plants, and must be trapped. For this purpose there is nothing to equal small flower-pots, each containing

a bit of dry moss or hay, and mounted on the top of the principal stake *above the plant*.

Dahlias vary very much in growth, and therefore need variations of treatment. Those that make over-much growth must be thinned so as to allow free access of light and air to the principal branches. Those that present a great number of flower-buds must be disbudded in order that the flowers may be of good quality. In removing shoots pinch them out when very young; and if uncertain about the extent of thinning required, take care to err on the side of leaving the plants rather too crowded, than to reduce them in a degree detrimental to their vigour. The shading, dressing, and exhibiting of the flowers are subjects that do not properly claim attention here, but we subjoin a list of first-class varieties that are likely to be considered good until 1880, and perhaps a year or two beyond.

SHOW DAHLIAS.—BEST FIFTY.

Light : *Julia Wyatt, Mrs. Brunton, Hon. Mrs. Wellesley, Unique, Queen of Beauties, Heroine, Dawn, Mrs. Dodds, Miss Henshaw, Peri, Anna Keynes, Alexandra, Princess, Harriet Tetterell, Flag of Truce, Adonis, Heby, Lady Derby, Caroline Tetterell.*

Yellow and Orange : *King of Primroses, James Hunter, Samuel Naylor, Chairman, Hugh Miller, Mr. Boshell, Charles Turner, Fanny Purchase, Leah, Lady M. Herbert, Vice-President, Royalty, Toison d'or.*

Crimson and Red : *Mr. Dix, Triomphe de Pecq, British Triumph, Bob Ridley, Sir Greville Smythe, Aristides.*

Purple and Maroon : *Indian Chief, Andrew Dodd, Lord Derby, George Wheeler, James Backhouse, Paradise Williams, High Sheriff.*

Lilac and Rose : *Memorial, Juno, Lilac Queen, Criterion, Mrs. Boston.*

FANCY DAHLIAS.—BEST TWENTY-FOUR.

Striped and Spotted : *Lady Dunmore, Madame Nilsson, Purple Flake, Octoroon, Regularity, Sam Bartlett, Ebor, John Salter, Artemus Ward, Butterfly, Grand Sultan, Leopardess, Viceroy.*

Dark Tipped : *Polly Perkins, Lady Paxton, Mrs. Crisp, Nora Creina, Pauline, Pluto, Queen Mab, Prospero, Fanny Sturt, Gem, Viceroy.*

BEDDING DAHLIAS.—BEST EIGHTEEN.

Light : *Queen of Whites, Alba floribunda nana.*

Yellow : *Duke of Newcastle, Golden Bedder, Golden Ball, Leah.*

Scarlet : *Beauté de Massijs, Scarlet Tom Thumb, Rising Sun.*

Rose and Lilac : *La Belle, Rose Gem, Scarlet Gem, Blonde.*

Crimson and Purple : *Tom Thumb, Crimson Gem, Royal Purple, Zelinda, Floribunda.*

FLOWERS FOR WINTER BOUQUETS.



THE best flowers for winter bouquets are undoubtedly those of the stove and greenhouse, bright with colour, fresh with fragrance, and with the soft and subtle texture of active life in them. Genuine winter flowers are a privilege of the few; for the many who cannot obtain them, dried grasses and everlasting flowers are of some service, and may be turned to wonderful account in the preparation of elegant bouquets. We must not waste space in eulogy, but assume that flowers and grasses are required for winter bouquets, and then proceed to the practical business of producing them.

First, as to the cultivation. All the annual sorts, both of everlasting flowers and grasses, are best grown by sowing the seeds in light rich soil in March or April, and treating them just the same way as asters; that is, in brief, insuring strong plants by the middle of May, and then planting them out. But if this is not convenient, they may all be sown on a rich light sunny border, in the early part of April. Every patch should be tallied, and a bit of seed of every sort kept in reserve. About the middle of May sow again any that have not, by that time, come up. By this plan you will be likely to secure all the sorts on which you speculate.

As for greenhouse everlastings, they require good cultivation. As the best of these is the *Aphelaxis*, a practical word on that may be useful. It is a difficult plant to grow, too much or too little water being pretty certain death to it. The soil should be good turfy peat, and plenty of silver sand. The pots should be prepared with great care to insure perfect drainage. The plants must be potted firm, and with the collar slightly above the surface. Plenty of light and air are essential. The beautiful *Phœnocoma* requires similar treatment. As for the greenhouse *Statice*s, they require a soil half loam and half peat, and a warmer and closer part of the house will suit them than the two plants first mentioned require.

Next, as to gathering the flowers. Take them in all possible stages; but by far the largest proportion should be young and scarcely fully expanded, as they are sure to expand in the process of drying. To dry them, lay them on papers in an airy warm place, *safe from dust*, and store them when dry in dry closets or drawers, where dust is as nearly as possible unknown. The grasses may be dried by simply laying them between folds of blotting-paper, or placing them between the pages of large, heavy books. Remember, "practice makes perfect:" the beginner is sure to spoil a few; never mind, there will be many good ones to make amends.

As to mounting, the grasses must be used in their natural state; but it is best to mount the flowers on wires. This is a nice proceeding; but ladies generally acquire the art in haste. The finest steel wire is the best adapted to the purpose, and it is

attached to the flower at the base by merely thrusting it into the centre; but the wire should have a few twists to make a sort of base to catch the flower, or for the natural base of the flower to rest on.

The best flowers for this purpose are the following:—

Helichrysus of all kinds; more especially *H. bracteatum*, *H. compositum*, *H. macranthum*, and *H. monstrosum*. All are half-hardy annuals, to be raised on gentle heat, and planted out in May, or sown in the open ground in April. As they are so useful, it would be well to try all the sorts the seedsmen can supply.

Acroclinium roseum.—

Sow in pots and pans in April, and place in cold frame, or sow in open border and risk it.

Rhodanthe Manglesi, *R. atrosanguineum*, *R. maculata*, *R. major*. All half-hardy annuals.

Helipterum Sandfordi and *H. corymbiferum* require careful culture. Sow, if possible, in February, and treat as perilla or lobelia. These are the least likely to succeed if sown in the open border in this country. They are, however so beautiful that they well repay a little extra care.

Polycolymnia Stuarti,—A quite hardy annual, but none the worse for being pushed forward under glass.

Ammobium alatum is a perennial, but may be treated as an annual, as it is sure to be killed by a sharp frost. Treat it as half-hardy.

Waitzia corymbosa, *W. grandiflora*, fine half-hardy annuals; but of no use to



BRIZA MAXIMA.

beginners for winter wreaths. They must be started early to make sure of good bloom.

Xeranthemum annuum, *X. album*, *X. caryophyllioides*, and *X. purpurea* are fine hardy annuals, all of which may be sown in the open ground in April. They are not the most desirable, as their colours are apt to fade when dried, but this may be in some part

prevented by drying them *quickly in the dark*, and in a very dry, warm atmosphere. Try them in an oven when the fire is nearly out.

The selection of Grasses may be almost indefinitely extended, and the hedgerows will supply many of the most lovely grasses in the world. The following, however, are worthy of special attention for associating with everlasting flowers.

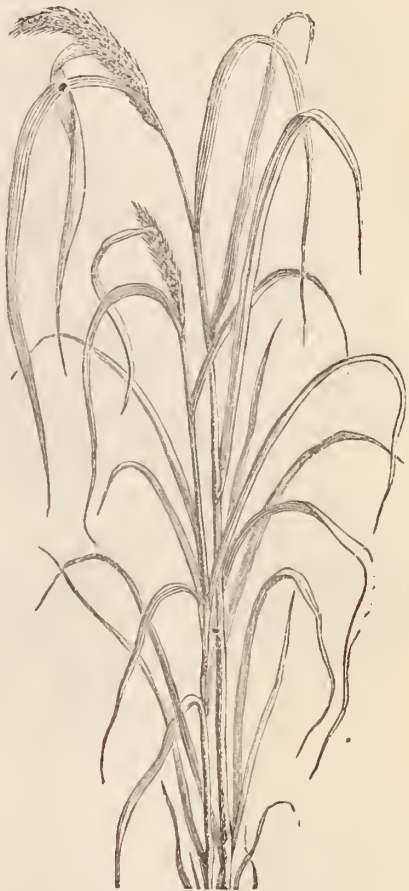
Stipa pennata is one of the most distinct of all our garden grasses. It grows superbly on a dry, sandy bank, and is adapted for a sunny part of the fernery. What grace, what delicacy, what is there in the vegetable kingdom to equal it for fairy-like elegance? Beware! In the seed catalogues you will see that seed is offered. True, seed is offered, but it is comparatively worthless, and the only sure way to secure this grass is to purchase plants.

Agrostis nebulosa, a most elegant grass, having stems as fine as hairs, and fruit panicles so light and "nebulous" that at a little distance a patch of this grass looks like a cloud of vapour. Some seedsmen send out *Polypogon Mouspeliensis*, under the name of *Agrostis nebulosa*.

Briza maxima is the most useful of the quaking grasses, but all the *Brizas* are pretty. This grass is much used for winter bouquets, and is invaluable to persons engaged in taxidermy, on account of its suitability for dressing up cases of stuffed birds, etc.

Chloris radiata is a very curious grass, the flowering occurring in a compound spike which consists of five or six separate rays, remotely resembling long fingers.

Lagurus ovatus, a favourite with those who grow grasses for bouquets. It is popularly known as Hare's-tail grass.



PANICUM ITALICUM.

Pennisetum longistylum, one of the most elegant grasses known.

Panicum Italicum is one of the best of a beautiful family. *P. capillare* is also a most graceful species. *P. Miliaceum* (common millet) is also well worth a place in any amateur's garden. Indeed all the Paniceums are well worth growing. So also is

Setaria Germanica and *Setaria macrochaeta*, the last being a thorough "cat's-tail" grass.

Eragrostis elegans cannot be surpassed for elegance when in flower, though until the bloom appears it has rather a coarse appearance.

Milium multiflorum is the most elegant of this elegant family. It is invaluable for winter bouquets to mix with everlasting flowers.



GROUP OF EVERLASTING FLOWERS.

Airopsis pulchella, a little gem for pot culture. When covered with seeds it is quite a curiosity.

Hordeum jubatum is the pretty squirrel's-tail grass, a good companion to *Lagurus ovatus*.

Egilops cylindrica, a stiff, quaint, and not inelegant grass, which comes in well for bouquets.

Lepturus subulatus, a wiry backbone sort of grass that will make any one laugh who sees it for the first time.

Bromus brizæformis, a minute grass of the most exquisitely graceful construction. It is a genuine candidate for complete

seclusion in fairyland; such a sordid world as this does not deserve to behold its beauty.

The mixed border will supply a few good flowers for drying,



GROUP OF ORNAMENTAL GRASSES.

such as the hardy statices and gypsophilas, and it is an easy matter to dry the flowers of double geraniums so as to preserve their brilliant colours in perfection.

GNIDIA PINIFOLIA.



THE delicious fragrance of this plant is of itself sufficient to secure it a place in the most select collection; but it is also a most profuse bloomer, each shoot terminating in a head of creamy white flowers, which, if guarded from damp and drying currents of air, retain their beauty and sweetness for several weeks. Like many other choice plants, however, it is somewhat delicate, and requires careful management. It is not very speedily propagated, but it is plentiful and cheap enough to render this of little consequence, and beginners will save time, and probably disappointment too, by leaving its propagation to those who devote exclusive attention

April.

to this department of gardening. In procuring young plants select those that are dwarf and bushy and in vigorous health, carefully avoiding pot-bound straggling examples; for when in perfect health and under good management some attention is required to produce dwarf compact specimens, and there is little chance of beginners effecting this unless they secure proper plants to commence with.

In order to obtain the greatest possible amount of growth the first season, the plants should be in hand, ready to be placed in a growing temperature early in March; but if obtained in the present season, with good management, they will make great progress before autumn. There is, however, no time to be lost by those who may purpose to make a commencement this season. On receiving young plants from the nursery the first thing to be done is to examine the drainage, etc., and if this is defective clear away the sodden soil, injuring the roots as little as possible, and repot in the same sized pots after securing perfect drainage; but in case the roots are found to be abundant and active, shift into a pot a size larger. As to situation and temperature, a position close to the glass, where the plants will receive all the light possible, is essential to the production of short-jointed wood during the spring months; this should be secured with a moist temperature ranging from 45° to 50° , allowing it to rise 10° or 15° by day with air. A gentle sprinkling overhead on the mornings and afternoons of bright days will be beneficial; water must, however, be cautiously supplied at the root, and with a moist atmosphere, but little will be needed until the plants start into free growth. It will be necessary to tie out or peg down the main shoots, and if the plants are leggy they should be cut back sufficiently to overcome this defect; but where necessary this should be done, and the plants allowed to start into growth before shifting, for there is considerable risk in cutting back fresh potted plants which are at all delicate; when they are in vigorous growth they will require to have their shoots frequently stopped; and this should be done in a regular manner, allowing the plants to make considerable progress, and the bases of the young shoots to become tolerably ripe, when every branch may be regularly pinched or cut back, and this may be followed up till about the middle of July. When the weather becomes mild, the plants had better be removed to a cold frame or pit, taking care that they do not sustain any check by the change. Here less attention will serve to properly care for them than if they were retained in a lofty house containing a miscellaneous collection of plants. Air should be admitted pretty freely, except during the prevalence of drying winds, when the lights should be raised on the sheltered side and the temperature kept down by throwing a slight screen over the glass; indeed, this will be beneficial for a few hours in the middle of the day, provided it is used only on bright days, not kept on too long, and discontinued early in autumn; but beginners are very apt to shade too much.

If all goes on well, a second shift will be necessary, probably in June, and vigorous specimens may be afforded a rather liberal shift at this season, observing to give it when they are in active growth,

and not immediately after cutting back; keep rather close and moist, and apply water to the soil cautiously until the roots appear to have taken to the fresh shift. Toward the middle of August begin to prepare the plants for winter, by gradually exposing them to the full influence of sun and air, and discontinue sprinkling overhead. At this season, the lights should be used only to protect the plants from heavy rains, and they will be better left off at night, unless when rain is apparent. As soon as the weather becomes cold or unsettled, remove the plants to their winter quarters, which should be near the glass, in a rather close part of the greenhouse, and during the winter months they will require no extra care except as regards a supply of water, and this must be moderate, as they are liable to suffer from any excess. Let the aim be to maintain the soil in a moist healthy state; the best way of effecting this is to give a liberal watering when the ball becomes dry, and no more until it is in that condition again. The plants may be allowed to flower in the greenhouse, which they will do about April, or they may be removed to any cool, dry, airy situation, where their fragrance and beauty will be more under notice. After the decay of the blossoms cut the plants back closely, and place them in a warm part of the greenhouse till they start into growth, when they may be shifted into large pots and placed in an airy pit to ripen their wood, or, if increase of size is the object, they should be treated as recommended last season. Plants which are of a satisfactory size may be placed out of doors, in a sheltered corner, after the young wood becomes rather firm, and allowed to remain there during the autumn; but where they can be retained where they can receive the protection of glass to ward off sudden rains, it will be advisable not to place them in the open plant ground, and if placed there they must be removed to the greenhouse early in the autumn.

Good rich turfy peat, to which may be added about a sixth part of turfy, sandy loam, with a very liberal mixture of sharp silver sand and a quantity of clean potsherds, broken small, or lumpy bits of charcoal, will form a suitable compost for this plant; but unless light sandy loam is obtainable it had better be dispensed with, using peat only. The soil should be broken up into small pieces, using the fine fibry portion only, and minutely intermixing it with the sand, etc., before use.

In potting, secure good drainage by using plenty of potsherds, and press the fresh soil rather firm about the old ball.

MANDEVILLA SUAVEOLENS.

BY A SUBSCRIBER.



MANDEVILLA SUAVEOLENS is not very suitable for pot culture, at least I believe it is not; for except the two first plants I had of it, I have never attempted to grow it in this manner. I am convinced, however, from the success which I obtained with those, that it may be made to bloom rather freely in a pot; and the fragrance and beauty of the flowers render it worth an effort to obtain them in that manner.

Were I to attempt its culture in pots, I would treat it as follows: and although the display of blossom which I might get would be poor compared with what plants turned out in the conservatory border, and allowed plenty of space to ramble about would produce, it would nevertheless be ample compensation for the little attention which the plants would require.

I would procure good strong young plants, say in March, prune them back closely, leaving but one joint of the last season's growth; then place them in a house where the night temperature might average about 50°, and when the plants started into active growth I would give a moderate shift, and stop the shoots once or twice, to insure an abundance of young wood.

When the pots become filled with roots, I would shift into the flowering pots, which should be fifteen or eighteen-inch ones, according to the strength of the plants. The vigorous habit of the plant renders a good-sized trellis necessary, which should be applied at once, and the shoots neatly and regularly tied over it. Water should be given rather sparingly at the root from the time when the plants are placed in the flowering-pots; but the syringe should be used freely, and the plants be kept in an airy, light part of the house, and if the night heat can be conveniently kept as low as from 50° to 55°, it will be more suitable than a higher temperature. When the trellises are well covered with wood, which probably may be the case by the middle of June, remove the plants to the greenhouse, placing them in the warmest end of it for a few days, to avoid injuring the foliage, by a sudden removal from a moist atmosphere to a dry one; and when they are inured to the change, expose them freely to sun and air, giving no more water at the root than will suffice to keep the foliage from flagging. This treatment, continued for three weeks or a month, will effectually check the tendency of the plants to make wood; and when this is effected, they may be placed in the warmest corner of the greenhouse, where they will speedily begin to open their blossoms.

The plants of the *Mandevilla* which I grew in pots were treated in the above manner, and I distinctly recollect that one of the specimens was very much admired, and produced a great number of clusters of flowers during August and September; the other was a weak plant when received from the nursery, and produced but a few clusters, owing doubtless to its having been stopped back later in the season

than the stronger specimen; both were planted in the conservatory the following spring, where they have been so satisfactory that I have never cared to attempt cultivating it as a pot plant. Those, however, who possess a conservatory or greenhouse, where climbers can be grown, will find the rafters the best possible situation for its growth, especially if the roof of the house is kept close, and the roots can be afforded a moderate space in a border composed of light sandy loam, which is the soil I would also recommend for its pot culture.

Whether in pots or turned out in the conservatory border, the soil should be kept dry after flowering, and till it may be desired to start the plants into growth in spring, and severe pruning is absolutely necessary to keep the plant within bounds; the young wood should be cut back to the last joint, except in the case of plants that may not have attained the desired size, and plenty of water should be given to keep the border in a healthy, moist condition during the growing and flowering seasons. It is readily propagated by means of cuttings of the shortest jointed wood, taken when rather firm, and planted in light, sandy soil, covered with a glass, and placed in a gentle bottom-heat; but the plant seeds very freely, and thus affords an easy means of increasing it to any extent.

THE CINERARIA.



HERE do we find a plant, which during the autumn, winter, and early spring months, is so gay and beautiful as this; or one which is so useful for exhibition or decorative purposes, or for the embellishment of the flower-vase or bouquet? By gas or candle-light the colours of some of the rose, crimson, and purple varieties are extremely brilliant; while the white varieties, margined with the preceding colours, are matchless. Add to this, that many of the kinds are agreeably fragrant, and you have nearly all the qualities which constitute a useful flower. In treating of the Cineraria as a plant for exhibition, or of its value for decorative purposes (and in the early part of the season the plants make a fine display), I cannot refrain from stating that their cultivation should be much improved, and, indeed, must be before they will assume their wonted standing upon our exhibition-tables. Only a few years ago Cinerarias were but a set of poor, starry things, with narrow, flimsy petals, and flowers supported by tall, unsightly stems; but now, thanks to the march of improvement, the best varieties are dwarf and compact, and when properly grown, produce perfect trusses of stout, and, in some few cases, of almost perfectly-formed flowers. When high cultivation is aimed at, peculiar treatment (which I shall presently describe) is required to produce stout, healthy cuttings, as from such the Cineraria can only be properly grown. As the plant is now in bloom, and seedlings will be required, a few of the most esteemed varieties should be selected for that purpose, bearing

in mind that those chosen must be of the best possible form, clear colours and marking, as much depends on this in producing new and first-rate varieties. When this is done, some secluded place in the garden should be selected, to keep them entirely apart from any inferior varieties, with which the bees would cross them, and produce muddy, unsightly flowers, instead of clear and well-defined colours. When the seeds are ripe, sow immediately in some shady place; and as soon as large enough, prick off thinly into pans or wide pots, and keep close for a few days, until they are properly established, when they may be removed to the open air until large enough to place in single pots: should large plants be required, they should be stopped when about two or three inches high. As soon as the seeds are gathered, the old plants should be cut down, or partly so, as in many instances the crowns of the plants rot if cut too close to the surface. Now that they are cut down, remove them to some shady place (a north border being preferable), until they throw up young shoots, when they should be potted into large pots, in a light compost, or planted out in the open ground in a light soil, where they will furnish strong cuttings, and from these only can good specimens be obtained. When they have grown about an inch or two, remove the cuttings, and place them in mould prepared for the purpose—composed of equal parts of loam, leaf-mould, and silver sand, taking care to well drain the pots with potsherds. When rooted (which will be in about a fortnight), pot off into thumbs or three-inch pots, in a nice light soil. Should first-rate plants be wanted, every care will now be required to keep them in a growing and healthy condition, to which end they should be shifted every few weeks until they receive their final potting, which should be about January; every care should be taken that they do not get pot-bound in small pots, as that would throw them into a blooming state immediately. The compost I would recommend for specimens intended for exhibition, and for large plants generally, would be two parts of good turfy loam, and equal parts of well-decomposed cow-dung and leaf-mould, with an admixture of silver or river sand. As the plants grow, take care to thin out all superfluous leaves, so as to admit the air freely and prevent mildew, which is a great pest, and which can only be removed by applying sulphur to the parts affected. The *Cineraria* should only be stopped once, as the second operation tends to produce weak growth. As soon as the shoots are long enough, tie out wide, keeping the outer branches as low as possible, and place them close to the glass, which will insure dwarf and compact plants. I had nearly forgotten the drainage, which should be of rough leaf-mould and potsherds mixed, which will keep the roots in a white and healthy state; fumigate occasionally, to prevent the green-fly; and water very sparingly through the winter months, increasing the supply as the spring advances, when weak liquid manure may occasionally be given.

SALVIA SPLENDENS.



CUTTINGS of this gay winter-flowering plant may be put in now, and afforded a gentle bottom-heat until they emit roots, when they should be potted singly in small pots. After potting place them in a close but not over warm situation, and as soon as they get established keep them near the glass, and afford them all the light possible, syringing overhead morning and evening in bright weather, and keeping the atmosphere as moist as circumstances will admit. If good-sized specimens are wished by the autumn, the young plants must not be allowed to suffer for want of pot-room. As they advance in growth the shoots should be carefully stopped and tied out, in order to secure bushy compact specimens; but if a vigorous root-action is maintained, there will be little difficulty in keeping the plants bushy. A cold frame or pit will be the best situation for them after the beginning of May, or earlier if the weather proves favourable; but they should be kept close here, and not allowed to sustain any check, which at this stage would be very injurious. If all goes on well, the plants will be ready for shifting into good-sized pots by the end of June, and I seldom repot them after that season. By that time they should be strong and well established in eight-inch pots, and when this is the case I shift some into twelve and others into fifteen-inch pots, according to the strength of the plants and the size it may be desirable to have them by the flowering season. They should be returned to their former situation, kept close and moist, and encouraged to make active growth, merely giving sufficient air to keep the young wood strong. When the pots get well filled with roots, and the plants become good-sized specimens, which will be the case by August, they should be gradually prepared for removal to a sheltered situation out of doors, where they will be shaded from the forenoon sun. Here they will make short growth, and will flower more profusely than if kept under glass all the autumn. Stopping should not be practised on plants intended to flower in November later than about the middle of August. As soon as the weather becomes unsettled in autumn, the plants must be placed under glass, for they are very easily injured by frost, and should be afforded a light airy situation. After flowering, the specimens may be thrown to the rubbish heap, reserving one or two to supply cuttings. These should be kept dry at the roots for a fortnight, then cut back rather closely, and placed in any spare corner of the greenhouse, until towards the end of February, when they should be placed in a warm house, and thoroughly watered, when they will soon furnish a supply of cuttings.

TREE MIGNONETTE.



COMMON Mignonette is so well known that it is superfluous to say a word about it. It is to the culture of it as standards for the winter decoration of the conservatory that I would now direct attention.

I generally sow in four-inch pots, about the end of March or beginning of April, according to the number of standards required. The soil I use is maiden loam and leaf-mould in equal quantities, with a little well-rotted manure and sand added. I drain and fill the pots in the usual way, but do not press the soil too firmly; I smooth the surface, and put a pinch of seed in the centre of each pot. I cover thinly with fine sifted soil; water gently; and remove the pots to the stove; or, if that is not available, to a hot-bed, and the plants soon make their appearance. As soon as they have grown a little, I pull all out but three of the strongest near the centre of the pot. After all danger of their damping-off has in a great measure passed, I remove the two weakest, and tie the other to a neat stake. I repot as the plants require it, and remove the lateral buds as soon as they make their appearance in the axils of the leaves, at the same time preserving the leaves on the stem carefully. The flower will soon make its appearance on the top of the stem; I remove it at once, and allow the highest lateral bud to grow to form the next leader to be tied to the stake as soon as possible; I remove the lateral buds as before, and so on till the stem is the desired height.

When the stem is the height required, I cut off the top, and allow four or five of the highest lateral buds to grow. As soon as they have pushed a little I pinch them, leaving only two buds on each; I allow them to start a little, and then remove the plants to a cool greenhouse, where they get plenty of air; I continue to pinch regularly as the plants grow, till the heads are the desired size (which will be about the end of September or middle of October), when they will require their final shift, using eight or nine-inch pots, according to the size of the plants. I procure some iron wire for supports, or neat wooden stakes. After being inserted into the pots they must stand two or three inches above the head of the plant, to allow all the laterals forming the head to be suspended from them with small pieces of bast. If they are not tied up carefully they will, as they grow, droop down and break, as Mignonette is a plant of straggling habit.

Treated in the above way, Mignonette will flower freely till the time when there is plenty to be had out-of-doors, when the plants may be thrown away. I prefer growing from seed every season. The little extra trouble required is amply compensated by the neat, compact form of the heads of the young plants.

Amateurs will soon find that there is a great difference in the habit of individual plants of Mignonette when growing for standards. Some of the heads will assume a neat, compact form, with fine broad foliage, while others will be of an opposite character. Seed should

be saved from the plants having the best habit for next season's growth.

I have little doubt that the common Mignonette will be superseded, so far as the growth of standards is concerned, by the new variety named *grandiflora*. It appears a very robust grower, with fine broad foliage, and will consequently require less time in forming a standard.

TREATMENT OF CACTUSES IN WINDOWS AND IN THE OPEN AIR.

BY AN AMATEUR.



HE plants commonly called by the name of Cactus belong to the natural order Cactaceæ, but are known among botanists and scientific gardeners by various appellations more or less distinctive of their generic peculiarities: as, for instance, the *Epiphyllum*, from a Greek word signifying upon a leaf, in allusion to the flowers growing upon the flat stems, commonly called leaves; and the *Cereus*, so called from the waxy and pliant nature of the shoots of some of the species; the Latin word *cereus* meaning waxy.

Cactuses are very common in this country, on account of the rough treatment they will bear; for, although they are natives of hot climates, as Brazil, Mexico, and Peru, and consequently soon killed by frosts, yet in other respects they are sufficiently hardy to allow of their general cultivation. They are magnificent objects in the stoves and conservatories of the wealthy, where they startle by the contrast between their gorgeous flowers and wrinkled unsightly stems; they also help to set out many a cottage window, and they are usually found, to some extent, among the floral collections of the middle classes. Yet with this general disposition to cultivate them, few plants are less understood in those habits on which their successful flowering depends.

"I wish you would look at my Cactus," said a lady to the writer the other day; "it is a very fine plant, but it never flowers." On being introduced to this unproductive occupier of pot and window room, a fine piece of vegetation indeed presented itself; above a yard high, as green as grass, and every flat stem as plump as a traditional alderman. "Madam," said the writer, "you feed your plant too much, and in order to make it flower you must at certain times adopt the starving system." He informed her he had one of the same kind, commonly called *Cactus Jenkinsonii*, not near so tall, and very inferior in *emboupoint* and general handsomeness, which yet bore above a hundred flowers last season. The inquirer expressed her wonder at this, and received the following account of the method adopted to produce such a result; it is now submitted to those readers of the FLORAL WORLD who may wish to make fat and green Cactuses bring some tribute to their floral temple.

In the natural home of the Cactus, there is a moist and a dry

season; during the former vegetation receives a surprising impetus; during the latter it flags, and appears almost burnt up and destroyed. Cactuses may be seen shrivelled up through the heat of the sun and the dryness of the soil, but it is to this circumstance they owe their abundance of flower-buds. The wet or moist season returns, and pushes those buds into a glorious life. How different is this natural treatment from the plan adopted in windows, and often in greenhouses! The plants are kept wet all the year round; they have no cessation in their growth, but they form no flowers. Let nature be followed, and the desired result is sure. My Cactuses were put away in the autumn into a lumber-room, and have had no water since until the middle of last March. They were then brought out covered with dust, cleaned, and gradually supplied with water. They are now as plump as can be wished, and are covered with flower-buds. They will be kept supplied with moisture until the flowering is over; then they will take their chance in a sunny part of the garden, against a south wall, until cold weather comes and consigns them again to the lumber-room. A light soil, composed of brick rubbish mixed with loam and leaf-mould, is best for them, and need not be changed every year, if the top is removed and a fresh layer put on every spring. Large Cactuses cannot be grown well in windows, and my plan with them is to put them out-of-doors every day, where they will have all the sun, and to bring them into the sitting-room just as they are about to flower. The whole tribe is easily propagated. The cuttings should have the wound healed before being potted, and no water should be given for a month or six weeks afterwards. Such is my simple plan.

LUCULIA GRATISSIMA.



NE of the most lovely, as well as one of the most odiferous, plants known in gardens is the *Luculia gratissima*; nevertheless, we seldom meet with it in anything like perfection.

In most collections, if existing at all, it presents so miserable an appearance, that even possessors of large gardens cease to care for it, alleging that it is impossible to grow it in anything like a creditable or healthy state.

It is a plant that does not require a high temperature, for it comes from the cooler parts of India, and the want of success may in some instances result from its being roasted to death. A few particulars, therefore, respecting the successful culture of this truly beautiful plant may not be unacceptable to my amateur readers. The most certain mode of increasing the *Luculia* is by layering. If the young shoots are slightly slit, in the manner pursued with respect to carnations, and pegged down in a small pot an inch under the surface of the soil, they will root readily, more especially if it is layered in autumn. Young plants so produced, if carefully preserved during winter, may be grown into fine flowering speci-

mens in one season. The situation it occupies in the house is one important point to be considered. If placed where a current of air passes over the foliage, it will dwindle and die. A quiet cool position is what it especially requires; and it should be partially shaded during bright sunshine. It will be found to luxuriate in the temperature of an ordinary conservatory, where the frost is merely kept out. I have known it to be exposed to nearly the freezing point without sustaining any injury whatever. The soil in which I have found the *Luculia* to thrive best is turfy loam, with an admixture of one-fifth leaf-mould, and one-fifth silver sand; let the pot be well drained, and the soil used in a rather rough state. Few conservatory plants are more ornamental than the *Luculia*, and if planted out where there is no draught, it will thrive and bloom in perfection every winter.

COVERING AND SUMMER MANAGEMENT OF WALL FRUITS.

BY A CORRESPONDENT.



MY purpose in writing this article is to draw attention to the subject of covering fruit trees, and also to offer some suggestions as to the summer management of those, especially, which have missed a crop; and such will, I fear, prove a fearful majority. For my own part, I have for years been an advocate of some kind of covering, have so repeatedly witnessed the benefits to be derived from it; and it does appear an extraordinary thing that any man in his sound senses should object to even a mat being hung over his pet apricot on a frosty night, and, not to go to extremes in the argument, say, with a thermometer eight or ten degrees below freezing point—by no means an unusual affair.

But, says the non-protection advocate, "I do not like covering, for it has a tendency to 'draw' the buds." It may certainly do this when coverings of very close materials are used; but, for my part, I have never seen anything worth recording in this way, and I have used covering extensively for at least twenty years. On the contrary, such things as thin canvas, spruce, fir boughs, etc., most decidedly retard the buds; for this reason I endeavour to get my trees covered at the end of February, drawing it off, if moveable, on all cold and windy days, and keeping close covered on those which are sunny or exciting.

My peaches are now in full blossom, or nearly so, and a finer sight in the peach or nectarine way I have never seen, and probably never shall see. The frost, to all appearance, does not seem to have affected them in the least. I need not inform the readers of the *FLORAL WORLD* that we do not possess a Devonshire climate in Cheshire; but I may add that these remarks, concerning the

peaches and nectarines blossoming, are made in the month of April. I doubt much if the majority of these, not treated on the retarding principle, have not attempted to blossom long since.

It is only a few days since, that I read in a contemporary paper some notes on the recent severe frost, in which the writer says that the destruction of peaches, etc., is unparalleled, every branch being encased in frozen snow. Now the question arises, is such obliged to be the case; and would the preventing such an occurrence ensure a crop?

Everybody must surely admit that he whose peaches or other fruit—be they what they may—blossom a week or two later than his neighbour's, has a superior chance in the majority of seasons, although perhaps the gardens join each other. I much fear that in the heat of the controversy which has long raged between parties about this matter, the great principle of timely retarding has been lost sight of. Every gardener must know how exciting the sunshine sometimes is on a south wall, especially even in the end of February. When on the heels of frosty or cold weather the blossom buds, with a change of atmosphere and intense sunshine, begin to unfold with a dangerous rapidity. Most, too, are aware that some plants—not indigenous—of a highly excitable character as to their foliation, frequently succeed better in a cold aspect than in a warm one. Here, then, is the principle of retarding, to which I would direct attention, only a stronger case still presents itself with regard to the south wall. I would now respectfully offer a little advice on the summer management of wall fruits, more especially the Peach and Nectarine, for although the culture of the latter has advanced in some degree, yet we do not generally see them perfectly satisfactory. This is, I conceive, in part owing to the neglect of careful summer dressing. Many omit the stopping of gross shoots, termed "robbers;" many more leave too much of the annual spray on their trees; the sure consequence of which is imperfectly-formed blossom-buds, many of which become either absolutely barren, or produce diminutive fruits.

It ought to be taken as a maxim by the careful peach-dresser, not to leave a single young shoot on the trees at the final disbudding for which a reason does not exist. This may appear hard doctrine to those accustomed to leave them somewhat at random, which indeed too many are compelled to do, through the want of a sufficient staff of the right sort of labourers; still we must not confound principles with mere expedients; my advice is offered to those who are more fortunately situated.

Disbudding should extend over a period of some three weeks or a month; and once a week during that period will set all right. In the first disbudding, the more foreright shoots, and those jammed in, should be removed; in addition to these, the shoots which compete with the leader should be rubbed away, and also any rival shoots at the lower part of each "fork," where an experienced peach-dresser will always direct his special attention, for it is of the greatest import that the very lowest-situated healthy young shoots should be preserved. This secures that succession of wood

which keeps up the future fabric of the tree. And what is said of the lowest fork (by which latter term I mean the angle necessarily formed by the divergence of any two branches), is equally true of all the other forks or angles all over the tree. The securing a nice young shoot annually at this point being to guarantee a lot of half-denuded branches, which, whatever fruit they may bear on their extremities, can never be perfectly satisfactory. Equal in importance to proper disbudding is the timely stopping or pinching of all gross shoots, which may be readily distinguished from ordinary wood, by their speedy tendency to produce side-spray, almost coeval with the extension of the growing fruit. These have (as may be guessed by the most inexperienced) a continual tendency to attract an undue proportion of the sap; and if left unmolested, or merely pruned in the "rest season," they will assuredly become dangerous monopolists, and naked portions of walling will be the sure consequence. The best practice, therefore, is to continue pinching off the heads of such as long as they continue to appear. To be sure exceptions will arise at times, such as in the case of young trees required to fill up a given space as speedily as possible, and which have not as yet begun to bear.

In such cases they may be allowed to ramble a foot or more in length during the early part of the summer; still, I am not assured that any very great benefits are derivable; a little off-hand appearance is perhaps the chief. Another point of paramount importance is freedom from insects; so important, indeed, that it is impossible to expel, and indeed difficult long to sustain the vitality of the trees, if such be permitted to infest them unmolested. A thorough syringing, two consecutive evenings, with tobacco water, and sulphur daubed as paint between the branches in April, have given me an immunity from the aphides and the red spider for some years. Blister on the leaves and gum on the wood is, I may say, almost totally unknown with me, as to out-door peaches and nectarines; and this I attribute in the main to a soil comparatively shallow. Summer disbudding and dressing is of nearly equal importance to our other fruits. A timely attention to this is indeed one of the prime secrets of successful cultivation, especially to trees on walls and under trellis culture.

The artificial twisting and bending of the leaders causes them at all times to produce a host of spray, not eligible to the purpose in hand, for Nature abhors what we so much admire—systematic training. We try to make neat and prim bushes, Nature is ever attempting to make them trees. We are ever trying to increase the amount of succulency and richness of pulp, Nature merely aims at perfecting the seed; thus a continual warfare is waged, and when true science is brought to bear, a knowledge based on a thorough appreciation of the character and habits of the tree, its mode of growth, and its root action, together with a just estimate of the character of soils, man comes off the conqueror; but he can only continue to hold his conquest by the most indomitable perseverance!

Apr. 1.

CULTIVATION OF THE JERUSALEM ARTICHOKE.



AMONG the whole of our esculents there is not another that will yield a more certain and abundant increase than the Jerusalem Artichoke, being liable to no disease, thriving with impunity in almost any soil, and braving with considerable productiveness the worst possible situations. It is an astonishing tuber. The frosts of this country have no effect upon it. It does not even require litter to protect it in any way, while potatoes may be destroyed to any extent by one night's frost.

Its nutritive properties are greater than those of the potato, which we all so much admire, and which it is to be lamented is likely to perish without any efficient remedy being discovered to prevent the calamity. Let us therefore meet the evil in the best possible way, with the most palatable substitutes.

Previous to the general cultivation of the potato, the Jerusalem Artichoke, as an article of food, was extensively planted in small gardens. With the French it is in much higher repute than with us, even amongst the middle and lower classes. About a century and a half ago, great attention and care were employed in its cultivation in France, as De la Quintyne informs us, and no doubt much of the success attending these early efforts may be attributed to the well manuring of the ground, to which no small degree of attention was paid, and to giving ample room between the rows, and between the sets in the rows, thus admitting sun and air freely amongst the plants. These particulars were evidently fully understood at that period; let us not overlook them now, but apply them in conjunction with our more extended experience and knowledge in the art of cultivation which has been effected in more recent times. Rely upon it, this root will liberally reward us for all the care we may bestow upon its culture. In many instances the artichoke bed in this country is assigned to some obscure and sunless corner of the kitchen garden, and one planting often suffices for a generation; like the horse-radish bed, it is dug amongst, and the roots cut and scattered about year after year, until plants spring up in all directions as thickly as a bed of rushes. The tubers themselves, as may be expected, are small and worthless, because they are grown in land as hard as a footpath, which is completely exhausted of every particle of nourishment. In addition to the remarks already made relative to the cultivation of this artichoke, I beg to give the mode I have successfully pursued in growing it.

Any soil capable of producing the potato is suitable for the Jerusalem Artichoke, always bearing in mind that, where the former thrives and produces best, the latter will succeed in like manner. Light, friable, loamy soil will always yield the best flavoured tubers. The soil should be deeply dug or subsoil ploughed, and a good dressing of farm-yard manure applied. It is quite useless to plant on poor, barren land, if a good crop is to be expected. They should be planted in rows, alternately two feet and four feet apart, and at least

eighteen inches apart in the row. The rows should extend north and south, thus allowing the sun to shine freely upon the soil; for, unless sufficient room is afforded for this in planting, their great luxuriance of foliage will completely exclude it; when planted in lines east and west, the soil is totally excluded from the rays of the sun, the want of which is clearly a matter of great importance. Some recommend the tubers to be cut into sets; I prefer planting them whole, using those of middling size only; doubtless, if the demand be great, then divide them by all means, but if no scarcity need be apprehended, then use whole tubers. I have always found the latter more productive. Plant immediately; not a day should be lost, as our short seasons scarcely admit of sufficient time for the complete maturation of the tubers. An intelligent correspondent recommends cutting off the stems at three feet from the ground. I should, in this case, allow nature to run her course; and with all plants having tuberous roots this course is preferable; if we wish to make the most of the tubers, they should both be allowed to ripen together—the one for food, the other for fuel. During the summer, the soil should be well worked over with the hoe, keeping it open and free from weeds. The crop will be fit for use about the same time that our late potatoes come in; they do not require to be dug up as the potato and protected, but may remain in the ground to be taken up as required for use; although, should frost set in, it will be advisable to have a supply housed in sand, where they can be easily come at.

SEED SOWING.



THIS season of the year will render more appropriate than at any other time some observations on what is a most important subject, although it may appear to some readers too plain and commonplace to need any comment. As the commonest terms employed in the language of ordinary life are those around which ambiguities and errors are found to cluster, so in all arts and sciences first principles demand earnest consideration as the fruitful source of success or failure.

Most observant persons must have remarked that in gardening, in all its branches, a few scientific rules rationally observed are the strongholds of the best cultivators. Let these be understood, and after processes are easy; let them be neglected, and no other advantages will compensate for the loss. In March and April all the main crops in the fields and gardens are expected to be in the ground, and Divine Providence has given to this time a seasonal character, adapted expressly to this important end. The temperature is raised, the soil is made dry and light by continued winds, while frequent showers support the germ until its deeply-struck roots make it less dependent on the state of the surface. Contemplating this arrangement with docility, we shall imitate it in our little

April.

operations. A finely pulverized soil pressing on all sides of the seed is found to assist its germination ; too much moisture causes it to rot, while a moderate degree of humidity is favourable to a vigorous growth. We shall apply these general remarks to our various departments of seed sowing which are interesting to gardeners, both in the flower and culinary departments. Never attempt to sow vegetable seeds when the soil is so moist as to stick to your feet. The month of March this year has been sadly trying in this respect, for on some lands no days have been favourable for sowing. Patience is exercised by delay, but the rule ought to be adhered to—for peas, beans, onions, etc., put into the ground when it does not crumble under the touch of the hoe cannot do well. The soil cannot be pressed on the seeds except in a hard, clayey texture, inimical to growth, and the surrounding land will be rendered hard and impervious to light and air by the treading. The same remarks fully apply to potatoes, for the lighter the soil is the better the crop will be.

If we follow Nature we shall not go very deep, for all observations show that even without any covering seeds will germinate and prosper. Acorns, nuts, peas, etc., left where they fall undisturbed, are sure to push roots downward. It would not do to place our rows of peas on the surface, for they would be disturbed in various ways, but when we cover them with soil let it not be too deeply.

If the ground is in a proper state, seeds should be trodden or rolled in. Last year I took the advice of a writer in the *FLORAL WORLD*, and rolled my onion-bed, when sown, with a heavy garden roller. I think I perceived the advantage of the plan, and the crop was certainly excellent, less disposed to run to neck than ordinarily. After sowing, if the beds or rows are not too extensive, it is better to guard at once against birds and cats by a slight covering of brush-wood. I use pea-sticks, laying them along the rows of peas and beans, and upon seed-beds. As soon as the peas are up, the sticks are on the spot for their destined service.

In reference to annuals and other flower-seeds, the same rules apply. Flower-seeds, sown in the open air, should not be put in too early, however inviting the weather may be. Stocks, marigolds, etc., sown in the end of April, will often be more forward than those put in in March. Heavy rains and cold winds stunt the growth of the seedlings, and frosts sometimes destroy them altogether. But my plan is always to sow annuals in a frame and transplant them.

When this is done, the beginning of April is early enough. In sowing care is required, or the moist heat of a frame will rot the seeds. The soil should never be wet. It will be found that small seeds will grow in mould which appears dry, better than in that which is sensibly wet. Abundance of air must be given.

OUT-DOOR MANAGEMENT OF CAPE HEATHS.



PROCESSES exhibited in the development of a shoot of any given plant, may, as a general rule, be advantageously studied under two heads—the elongating and developing process, and the maturing or solidifying process. And still, assuming general principles, for exceptions must be allowed, in proportion as a plant has been liberally treated in the preceding season of growth, so will the development of healthy and vigorous shoots take place in the present one. Not so with the solidifying process. The present circumstances are the only ones which can possibly affect that; and no intelligent gardener will deny that on the maturity of the branch depends the quantity and quality of both flower and fruit, in any case in which either one or both may be desired.

To enter into the physiological why and because of the matters here alluded to would, perhaps, be out of place, and extend this paper to an undue length. Not that I deem such an exposition would be useless or pedantic, for intercourse with gardeners, as a body, not individually, far from it, assures me that the general principles of the physiology of vegetable life are not so well understood as they ought to be.

And considering how useful such knowledge becomes when employed as an auxiliary to sound experience, it cannot be too much urged upon all members of the calling. Operations which in practice can only be rewarded by successful results after a circuitous and, in many cases, uncertain route, may, by bringing a knowledge of physiology to bear upon the subject, be made a certainty by a much shorter and more certain route.

What a good chart is to a traveller in a country comparatively unknown to him, a knowledge of vegetable physiology is to a gardener in the daily round of his operations.

And as it often happens that to accommodate a large stock of plants room has to be economised by crowding, if the wood of the current season has not been fully matured, fearful ravages are occasioned by damp, and the plants are fully alive to every external circumstance which could possibly affect them, which if properly matured, they would have defied. It is a matter of question, when all circumstances are considered, as to the policy of exposing exotics, under pot culture, to the ever-varying influences of our climate in the summer months. But in the present state of horticultural buildings there is scarcely any alternative.

As “much might be said on both sides,” and as the more prevalent opinion and practice are in favour of summer exposure, I forbear agitating the question at present—a question, nevertheless, of paramount interest to gardeners generally.

As the heath revels in a constantly moving and cool atmosphere, and as existing houses appropriated to plant culture do not furnish the means of affording such requisites, when the sun has obtained a moderate altitude removing to the open air becomes necessary.

The choice of a situation is the first and great consideration, and that the meridian sun should be prevented from exercising a direct influence, is indispensable. The plants should enjoy the full sun from rising till 10 a.m., and from 3 p.m. till setting. If no natural screen from trees can be made available to intercept the solar rays during the hottest part of the day, artificial appliances must be resorted to; but the former is preferable both as to economy in time and the natural intervention being more congenial than an artificial one. The season for removing the plants from the house must be entirely regulated by existing circumstances. Seasonal influences, and a thousand local considerations, must determine the minutiae of the matter. But it will be borne in mind that the whole of the stock will not require removing *en masse*. A plant in full bloom, or one barely established after repotting, will of course form exceptions. Progressive operation is the gardener's watchword, and in the subject under consideration superlatively so. You cannot take Nature by storm.

Gardening in all its branches is an attempt to imitate natural phenomena by artificial means. Losing sight of this fundamental principle often leads to disastrous consequences.

It has ever been a favourite operation with gardeners, where it is practicable, to plunge in some porous material all plants removed to the open air in the summer months; or perhaps I ought to write all delicate hair-rooted and hard-wooded plants similar to the genus under discussion. The practice undoubtedly in many cases is the best that could be adopted.

A plant with a pot well filled with roots, which from its size or other circumstances it is not deemed advisable to repot, will of course be much less liable to suffer from drought, or from the influence of the heated pot on the delicate hair-like fibres plunged, than one wholly exposed. In this case, and similar ones, plunging is advisable, but in others plunging is not only not beneficial, but absolutely injurious, at least in my opinion.

Scantily rooting plants, or specimens in delicate health, should not be plunged at all. It impedes the free passage of moisture from the roots, and induces saturation—two important subjects to be considered. If it is thought advisable to protect such roots in any way, the best mode is to place the pot inside another pot, with a stratum of moss between, taking care that the drainage is not impeded. In placing the stock of plants in their summer quarters, the quick growing and robust specimens should be separated from those of weaker growth or delicate health; and some provision should be made for protecting the latter from heavy rains. Violent thunder-storms arise very often during the night, when no one is at hand to protect; and as much damage may ensue to the weak and delicate specimens from the violent rain generally accompanying such storms, it is far the better and safer plan to secure an awning of sufficient strength to break the violence of the rain.

This can be placed the last thing at night over the weak or invalid portion, which, as it is hoped, will form but a small portion

of the whole; the operation will not be attended with much difficulty. It is the presence of violent rains which will test and prove the efficacy of thorough drainage in the pot cultivation of plants generally. If this particular has been neglected, much annoyance will be occasioned; therefore, both after watering and fall of rain, examine the plants.

If any symptoms of their being "water-logged" are observed, take remedial measures immediately, for you may rest assured that such being the case, all other attentions will be rendered neutral. No plant can possibly flourish if such be the case, and the only remedy is thorough drainage. During hot weather the application of water will form an important feature in out-door management. Nor is it sufficient that you supply it directly to the roots of the plants. After a hot day, and an hour or two before the sun wholly leaves them, the syringe must be brought into play; and during hot sunshine, let the pots be often syringed over, and the ground, both between the plants and around them, often under the influence of the watering-pot.

By these means a cool atmosphere will be secured, for it is a law of matter that rapid evaporation produces coldness; and when a plant is in rapid growth a considerable quantity of moisture is absorbed by the leaves, and by furnishing a constantly evaporating surface the surrounding atmosphere is loaded with moisture. In the morning the application of the syringe will scarcely be found necessary. Heavy dews, except in cases of a cloudy atmosphere or drying winds, will supply its place. And when you look upon them in the morning, with every leaflet rejoicing in the sunshine and moisture, and their whole foliage exhibiting a vivid green, you cannot but admire them, fancifully imagining that they welcome you with a gladsome look. As the sun decreases in his altitude, and the young wood begins to assume maturity, moisture in every form must, of course, be decreased in proportion. Still many well-rooted specimens will require constant attention in this matter. Few plants absorb more moisture than heaths in full vigour, other circumstances being similar.

I should have observed before that many persons place porous stones, or pieces of potsherds, on the surface of the mould around the stems, to prevent a too speedy evaporation. In this—

"The bane and antidote are both before us."

It may possibly prevent evaporation; but, on the other hand, it prevents us ascertaining the degree of moisture in the soil, and is apt to lead one into the belief that water is not required, when the contrary is the case. Therefore all auxiliaries of this kind had better be discarded, relying entirely upon constant and assiduous attention.

RHUBARB.



THIS wholesome and agreeable vegetable has become so popular as a substitute for fruit in the early spring, that no garden should be without it. It will grow anywhere, is so hardy that no frosts will injure the roots, however much exposed, and is so prolific that a few plants will yield a plentiful supply of stalks for a large family. Yet notwithstanding the ease with which it is cultivated, we often see it badly grown, and sometimes hear the complaint that parties have failed in their efforts to get a crop. Our remarks will obviate every objection, if attended to, and enable our readers to grow rhubarb for themselves with ease and success. Rhubarb has a hard underground stem, which pushes forth buds plentifully at the crown, or part nearest the surface; every one of these buds taken off with a portion of root adhering to it, will form a large plant in one season. If you wish to make a plantation now (although the season is rather too far advanced, it may still be done), get as many buds or crowns as your bed will admit of, allowing each two or three feet every way, according to the habit of the varieties you prefer. The plan generally adopted is to purchase as many roots as are necessary to fill the allotted space, but this is a more expensive and far less eligible method than the one now recommended. Last year a new sort of rhubarb was offered in the neighbourhood of the writer at five shillings a plant. Some of his friends purchased four or five roots, but he was satisfied with one. On receiving it he placed it in a hole, and covered it up with soil until February, when, on examination, five good buds were developed. The root was then divided into five parts, each of which, at the present time, is a large, flourishing plant, equal to any of those which were not divided. A bed was thus obtained for five shillings, equal, indeed superior, to some costing twenty-five shillings. We are convinced, from actual experiment, that rhubarb may be brought to perfection in one year; that old beds are inferior to new ones; and that fresh plantations should be made every year. The old plan of making a bed to descend to posterity should be exploded, in reference to many garden productions. Strawberries, raspberries, rhubarb, etc., etc., should be removed often, if fine healthy produce is wished for.

Having a sufficient number of buds or crowns, let them be planted in a well-trenched and manured soil. If the leaves are developed, care must be taken to prevent their flagging. This may be done by placing over them some long litter, sufficient to answer the purpose without excluding light and air. The young plants will soon be established, and will grow rapidly. No leaves must be taken off the first year, as the object is to convey all the elaborated sap possible to the stem for future use. If the ground is good, and kept free from weeds, no more care is required, and abundance of fine stalks can be taken off next spring. An exposed situation, with plenty of sun and air, will of course bring this production to greatest perfection; but it will produce good crops without having these advantages fully. Every house with a garden, however small, may

thus furnish the table of its owner, with little expense and trouble. But rhubarb possesses the advantages of being forced with as much ease and as cheaply as it is grown in the open air. This may be done by growing it against a wall in a sunny aspect, and covering it when required with pots or boxes, over which fermenting materials must be placed. But decidedly the best method is to take the roots into the house to be forced. For this purpose they must be grown exactly as recommended above, that as much power may be treasured up in the roots as possible. To take up exhausted plants from a crowded bed, which has been stripped of its leaves during the season, is to deprive them of their natural advantages, and to expend the forcing process on weakened and imperfect subjects. Let cuttings, with a crown to each, be now put in, in the best possible situations, and by autumn they will be admirably adapted to your purpose. When the foliage is withered, take up the roots, and put them singly into large pots or boxes. These may be stood away anywhere, and introduced, two or three at a time, into a warm situation. The writer placed his pots this winter in a dark closet, at the back of a kitchen range, and the rhubarb grew rapidly. Every house can find some spot having the advantage of greater warmth than the ordinary temperature. Rhubarb may thus be had at any time, and a good supply kept up until it is produced in the open air. It is very necessary to get it as early as possible, as its value is much lessened when gooseberries are plentiful.

POINSETTIA PULCHERRIMA.



EW plants are more really useful than this, both for decorative purposes and for furnishing cut flowers; but unfortunately it is of a very straggling habit, and is not easily induced to form anything like a handsome well-furnished specimen.

Pieces of the ripened wood would root readily if planted in light sandy soil, and afforded a gentle bottom-heat; or propagation may be effected by means of eyes treated in the same manner as those of vines. Young shoots coated where cut with collodion would doubtless also root freely. In this case, by planting a sufficient number in a good-sized pot, there will be no difficulty in obtaining compact bushy plants. The cuttings for this experiment should not be taken off until they are strong and rather firm, and of course stopping must not be resorted to, for the operation practised late in the season causes the plants to produce their brilliant floral leaves both scantily and small. Cuttings rooted at the present time should be potted singly in small pots, and placed in a close, warm pit, affording them a gentle bottom-heat till well established in their pots. When this is the case, shift into pots two sizes larger, using a rich, light compost, say one half prime turfy loam, one-fourth leaf-soil, and one-fourth of old thoroughly decayed cow-dung, well intermixed with plenty of clean, sharp sand, and lumpy bits of charcoal, to secure perfect drainage.

April:

If convenient to afford the plants bottom-heat till established, after this shift it will be beneficial to them. But they must now be kept near the glass, and exposed to all the light possible, in order to induce them to make strong, short-jointed wood. And when they are well established, they should not be kept too close, as a moderate supply of air is necessary to secure strong wood.

As to stopping, this must be regulated by circumstances, for it is useless to stop unless the eyes are somewhat prominent, as in this case only the uppermost would start into growth. The shoot should be bent so as to check the flow of the sap, and induce the lower buds to push slightly before stopping; but it must also be borne in mind that there is no chance of obtaining a fine display of scarlet bracts except in strong well-matured wood, and stopping must not be practised later in the season than will allow of securing this. Keeping the plants rather dry at the root, when a fair amount of growth has been obtained, and placing them in a rather dry atmosphere, will be useful in checking growth, and producing a tendency to flower. When in bloom, the plants may be placed in a close part of the conservatory, taking care to guard them from damp and currents of cold air. After blooming they should be kept rather dry at the root, placing them in any out-of-the-way part of a house, where the temperature may average from 45° to 50° ; and when the leaves fall off, cut the shoots back to two or three eyes each.

As early in spring as circumstances will admit of affording the plant a gentle bottom-heat, with a moist-growing temperature, shake the old soil from their roots, and repot in pots just sufficiently large to admit the roots, and water very carefully until they start into growth. By treating the plants as directed above, and keeping them near the glass, and the branches tied out, etc., to induce strong growth, good-sized specimens will be obtained the second season. Manure water may be given with advantage, in a clear rather weak state, to plants filling their pots with roots.

SARRACENIAS.



HERE the accommodation necessary for the successful cultivation of these plants can be found, a few of them should be grown, as they are extremely interesting, and, under proper treatment, they grow freely. They are not difficult to flower, and their blossoms are pretty enough, but it is the curious pitcher-like appendages belonging to the leaves which render them worth attention. They are found in a wild state in swamps in North America, and are by no means tender; but, as their natural habitats indicate, they require a moist atmosphere, plenty of water at the root, and a warm shady situation during the growing season, to have them in perfection.

Those who intend to commence their culture should procure a healthy young plant at once of each of the following varieties, viz.,

S. purpurea, *rubra*, *variolaris*, and *Drummondii*. They should be placed in a low pit, where the temperature can be kept at about 60° by night, allowing it to rise to 75° or 80° with sun-heat, before admitting air—shading bright sunshine, to prevent the necessity of drying the atmosphere by currents of air to keep down the temperature. Turn the plants out of their pots, removing as much of the old soil as can be done without injuring the roots, and repot them in convenient sized pots, using light fibry peat, broken up roughly with the hand. Fill the pots about half-way with crocks, on which lay some thin pieces of peat; and in potting be careful to pack the soil closely and nicely about the roots, and cover with a thin layer of sphagnum, which will give the whole a neat appearance. The pots should be placed in saucers, which should be kept regularly filled with water during the growing season, and water must be frequently changed, always using water at a temperature of 80° or 90°. Keep the atmosphere thoroughly moist by frequent syringings during bright weather, and keeping the pit close; and also see that the soil about the roots is kept regularly wet, for any approach to dryness would be injurious to the plants. As the specimens advance in growth, attend to affording them sufficient pot room, and do not defer shifting until the plants suffer for want of sufficient space for their roots. By following out the above system of treatment during the growing season, the plants will make rapid progress, and will form nice-sized specimens by autumn. At this season they may be removed to a warm corner of the conservatory, or show-house, where, by covering them with large bell-glasses, to secure the necessary amount of moisture, they will be quite at home for the winter months, provided a temperature of about 45° is maintained. Water must be liberally supplied, however, to the soil, and if convenient to continue the use of pans, it will be advisable to do so, as this will insure keeping the roots regularly moist. Should the plants show indications of injury from the confined atmosphere, remove the glasses at night, replacing them before giving air to the house. In the absence of better accommodation, the plants may be grown during the summer in a one-light box, in which, if it be kept close, and properly managed, they will be quite at home; but artificial heat must be afforded in spring, otherwise large specimens will not soon be obtained, nor will the plants bloom freely. Propagation is easily effected by means of division, which should be done just before starting the plants into growth, taking care to select some promising pieces for rooting, and also to keep the young plants close, warm, and thoroughly moist, until they become well established in their pots. The same care must be observed with the young plants as to placing their pots in pans of water, etc., as recommended above.

REMINDERS FOR GARDEN WORK IN APRIL.



IG up the borders in which there are herbaceous plants or bulbs as soon as their contents are through the ground; be careful not to injure them; then rake and clean the borders.

CARNATIONS and PICOTEES.—Pot them in No. 8 or No. 12 sized pots; put two inches of crocks at the bottom, then a quantity of the mould got ready in February and turned over weekly since. The pot containing the plants must be turned up and struck against a table or some other substance, when the ball of earth will leave it, rub off the surface a little; now let this be adjusted in the large pot, to bring the collar of the plant, that is, the lowest part of the leaves, within half an inch of the top edge; fill up all round and water gently. Let them be under a roof if possible, or at least in a sheltered place, and be carefully looked after that they be not too wet nor too dry. All those that cannot be potted for blowing, should be planted in rows, a foot apart in the rows, and two feet from row to row.

DARLIS.—Now put the whole of the old roots to work, if you have not done it before. Pot them with the collar of the root above the surface of the soil, and place them in the heat of a common hot-bed made up for cucumbers or for the purpose. If you are only going to divide the roots instead of propagating largely, throw them into the hot-bed without potting, and as soon as they show their eyes, cut a piece of root to every eye, and pot them to grow slowly till planting time.

TULIPS.—Use more diligence than ever to keep them from frost; as they advance they are more susceptible than ever of a check.

RANUNCULUSES.—Stir the earth between them, and break it small, close it about their roots.

Take cuttings of all the ordinary clump and lawn plants, unless you struck them in the autumn. Petunias, heliotropes, verbenas, salvias, fuchsias, brugmansias, and other quickly-growing subjects, are all readily struck with a little bottom-heat. Some gardeners use a pot only half full of soil, and then they are able to cover them with a flat piece of glass; but the whole of these strike like weeds with a little bottom-heat.

ANNUALS of the more hardy kind may be sown in the borders at the beginning of the month, but all the ordinary border annuals may be sown at the end of it. Tender annuals may be sown in a slight hot-bed. Those which have been wintered in frames may be planted out towards the end of the month in the places they are to bloom in. Mignonette may be sown in pots and boxes for the windows.

AURICULAS are now rising for bloom fast. If the pips in a truss are crowding each other, take out some of the smallest and weakest, leaving about eight to perfect themselves; but if there be a large number, thin them out only enough to give room to the remainder. Towards the middle of the month they will begin to show colour. They must then be removed to a shady situation, where they must be thoroughly covered from cold winds and shaded from the sun. The smallest check by frost or cold winds will spoil the bloom; as they open there should be bits of cotton or moss stuck between the foot-stalks to keep the truss all in its place, and give the flowers room to open properly; they will then bloom in perfection.

ROSES.—If the opening buds of roses disclose any symptoms of disease, they must be examined and the grubs picked off. The latter end of the month the portion of roses left unpruned must be pruned as the former ones were; it will throw the flowering back a month, and make a second season.

BIENNIALS, such as Canterbury bells, wallflowers, two-year stocks, sweet Williams, hollyhocks, dwarf and tall rockets, etc., must be planted out where they are to flower.

WALL-FRUIT TREES and TRAINED TREES.—Cut off all shoots that grow outwards, and all others which grow in the way of better ones; clear the walls from snails, slugs, etc.

VINES, if you wish for young plants, may be layered ; that is, any healthy branch which can be spared, cut a slit in it between two eyes three inches long, bend the part under ground, and with a strong hooked stick peg it fast, and then drive a stick in to fasten the upper part of it ; it will strike root by October.

VERMIN.—Examine all fruit trees and bushes, and clear them of vermin.

SEAKALE.—Sow the seeds in a small bed, and cover an inch in depth. Refresh with water when it gets too dry.

RHUBARB.—If you raise this from seed, now is the time to sow it in good rich soil.

RADISHES.—Continue to sow.

POTATOES.—Plant more potatoes for a fuller crop than the last : middling potatoes whole are far better for the cottage than cut sets of larger ones. It is a fallacy to conclude that the largest potatoes have the largest eyes ; there is no fallacy in preferring a whole potato to a cut set ; if they do not go quite so far as the usual distance of sets, you have only to plant them wider apart and get a heavier crop to each : we have seen a better crop of potatoes from chats thrown by for pigs, than from many of the most highly cultivated grounds when cut sets were used. Plant as directed last month. If you are obliged to use large potatoes, cut each piece with one or two good eyes to it. Cut sets may be planted nine inches apart ; whole potatoes, though smaller, should have a foot distance between each other.

SAVOYS, BROCOLI, and SCOTCH KALE or GREENS, should be sown this month, about the middle, if the weather suit. Make up a bed and sow a good patch of each, according to your wants. Let the bed be well dug and dressed for them.

HERBS of all descriptions should be slipped or parted, and planted to make fresh beds where necessary.

PEAS should still be sown once a month, or even twice, according to the consumption.

ONIONS.—Sow the main crop. Let the ground be well dunged and dug, and sow as before.

LETTUCE.—Sow more lettuce. Indeed these as well as peas should be sown in smaller quantities and continued every month, so long as the supply is required.

BEANS, also, if required, should be sown again, as soon as the last sowing has got the second pair of leaves open. Sow them in rows to bloom where they come up. Let the rows be two feet apart. Earth up those which are growing fast.

CELERY.—Sow a piece of the size of a large handglass or of two glasses for the main crop, and use the glass to protect them.

SMALL SALAD may be sown as required.

TO CORRESPONDENTS.

CINERARIAS.—*B.D., Salisbury*.—Should you desire to grow on your Cinerarias for a second season treat them in the following manner. After flowering, the old stems should be cut away, and the stools shifted back into small pots, using a sandy soil and keeping the plants in a very cool shaded place through the summer, preserving through the winter in the same manner as you would seedlings, and repotting them in larger pots about the middle of February, using a soil composed of loam, leaf-mould, and well-rotted manure. The offsets may be removed.

DAHLIA IMPERIALIS.—*B.D., Salisbury*.—*Dahlia Imperialis* requires a good loamy soil, and while in full growth must have abundance of moisture. If properly treated it blooms well out of doors and should equally succeed in a cool

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greenhouse. It may be cut down after blooming and must be safely preserved from frost. A clever article on the plant appeared in the *FLORAL WORLD* for May, 1870. We should not advise pruning the oleander, the best time for pruning is immediately after the summer bloom.

VARIEGATED IVIES.—*P.B., Nantwich.*—We have not space to enumerate all the beautiful varieties of the ivy; but the following are very attractive: *Hedera helix nigra*; *H. h. aurea*; *H. h. lucida*; *H. grandiflora pallida*; *H. g. maculata*; *H. h. chrysophylla*; *H. h. marginata grandis*. We should advise you to consult Mr. Hibberd's exhaustive treatise on the subject, any bookseller will supply it to you. It is probable that your vine was insufficiently fed while in full vigour of growth, and by a deficiency of water the berries got hard and were unable to expand when a large supply of juice was thrown into them. The evil you complain about will be best remedied another season by judicious treatment while the vine is growing.

ASPARAGUS BED.—*H.S., Aylesbury.*—You do not tell us the age of your bed. It is not desirable to cut until the third year.

GOURDS.—*W.H.A., Shaftesbury.*—The best gourds for summer use are *Moore's Vegetable Cream*, and *Hibberd's Prolific Marrow*. The best as a winter vegetable is the *Round Warted Squash*. For further information we should advise you to consult Mr. Hibberd's new book on *The Kitchen Garden*, which has lately been published, and which contains a large amount of new and valuable information.

HYACINTH BULBS.—*C.B.G., Acton.*—The bulbs imported into this country are usually sent here in their third year, that being the period at which the bloom generally attains its greatest perfection. Subsequent to that period the energies of the bulbs are more devoted to offsets than to bloom, and consequently the flowers suffer. The offsets can be grown until their third year, when they, under proper cultivation, should attain their greatest perfection, but they should not be allowed to bloom until their third year. We anticipate yours are imported bulbs, and therefore you may expect offsets from them next year instead of good bloom. We do not recommend painting the inside of flower-boxes, and Mr. Mollison in his work, *The New Practical Window-Gardener*, speaks decidedly against the practice. We are glad to hear that the magazine has been of service to you, but we must be proof against your compliments and preserve our incognito.

DEFORMED CYCLAMEN AND GERANIUMS.—*H. T. Humshough.*—Your plants are evidently infested by some insect. Try a good fumigation.

ASPARAGUS.—*C.S., Chepstow.*—The mould applied in autumn should be forked over, and if more than six inches in depth a part may fall into the alleys. The manure in the alleys must not be disturbed; in the course of the summer it will be filled with strong roots, which will much improve the shoots in the spring.

TOMATOES.—*Ignoramus.*—Tomatoes should be raised in heat; they may be planted at the foot of a dry bank or against a trellis where they are not exposed to currents of cold air.

VINES SHANKING.—*P.S.T., Hants.*—The shanking in your case appears to arise from your vines being allowed to bear more branches than they can carry. This affection arises, however, from so many causes that we cannot undertake to say whether we are right or not in our conjecture.

THRIPS.—*C. Neal.*—The odour from bruised laurel leaves is said to kill Thrips. The leaves should be dispersed all over the frame, but they must not be allowed to touch the plants. Shut up your frame and allow it to remain closed for two hours, then give a little air, but allow the laurel leaves to remain for a few hours longer. After the laurel leaves are removed syringe the plants with warm water.

ORANGE LEAVES.—*Amateur.*—Judging from the appearance of the leaves your Orange-trees are in a bad state at the root. Imperfect drainage is probably the cause of the evil. We should advise you to repot them now into a compost of fibrous loam and peat well mixed together, adding pretty liberally rough pieces of charcoal. They like the very strongest manure, but be careful to have the pots well drained.





CULTURE OF THE DAHLIA FOR EXHIBITION.



THE following concise rules, to be observed in the successful culture of the Dahlia for exhibition, are not furnished so much for any novelty which exists in the practice recommended, as to point out a few of the most essential things to be done at the proper time.

For economy in carriage, the plants are grown and sent out in small pots; therefore, on receiving them from the nursery, place them in a close frame for a day and a night to recover them from their confinement; then repot them into four-inch pots, using rich soil; the pots should be drained with coarse partly decayed leaf-mould, so that, in planting out, there will be nothing to abstract from the ball of earth.

A good start is of great importance; therefore, care should be taken that the plant is grown to a fair size without drawing during the time it is in the pot; the stouter it is the better, without being tall: and it should not be pot bound at the time of planting out; both the roots and the point of the plant should be in a thriving condition, and free from aphides. It may perhaps be unnecessary to state that the plants must be carefully hardened off before they are turned out. If the soil and plants are in a proper state, the first week in June will be a good time for the general planting, which, with ordinary care and attention, will produce good blooms in time for the earliest exhibition. A short period will suffice to have plants of a good size, but it should be borne in mind that hours lost in repotting them when in a young state, will make a difference of days in the time of blooming, and it is important that this should be clearly understood, that no neglect in the matter may be permitted to take place. Examine the plants often to see if any require water; by no means let them become dry so long as they are in pots. Secure them with proper and strong fastenings at the time of the planting; water whenever they require it, and sprinkle the foliage slightly almost every evening with soft water. Tie out the branches, and, as the plant increases in size, secure the side-shoots firmly to extra stakes. Cut away all superfluous small shoots. Some varieties have scarcely any to remove, while others have a considerable number. Fearless is of the class which has but few shoots requiring the use of the knife; but such kinds as Shylock require it freely. Indiscriminate pruning must therefore be avoided. Study the habit of the plant, and consider if the flower will be improved by increased size; all varieties need some thinning and disbudding, which should be effected at different periods.

Small flowers require it as soon as the young shoots and buds can be removed, while large flowers, such as the Thames Bank Hero, Princess Louise, and many others, would be rendered coarse and valueless for the purposes of exhibition if a number of buds was not permitted to remain till the plant was coming into bloom. Size in this case would be gained at the expense of quality; besides, there is the advantage of having three blooms where two would be

grown. On the other hand, size, in moderation, must not be lost sight of. It was not with small blooms that I have taken first prizes for these last fifteen years. I would therefore advise the young grower to avoid the two extremes. In shading blooms for exhibition, as a general rule, they should be one-third blown before they are put under the shade; and take care to secure such as appear to be coming good, and at the time they are required, from injury by friction. Slugs and earwigs are very destructive, and must be perseveringly kept down from the time the plants are put out till the end of the season. If you should be annoyed by a small black insect (which is often the case in July), use every means to encourage the plants to make rapid growths, by watering and syringing them overhead, and by brushing the depredators from the points of the shoots. Snuff, tobacco-water, and various remedies are often resorted to; but these if effectual in killing the pests, generally destroy the points of the shoots; if the plants are in a thriving condition, they will soon recover themselves. If the season proves dry, water freely two or three times a week; but never let it be done by driblets; give a good soaking when you do water, if that should not be so often. Employ manure water once a week as soon as they begin to throw up their buds; but it should be used in a weak state at the commencement.

Before concluding these remarks, permit me to bear witness to the increasing interest taken both in the culture of the Dahlia for competition and in the raising of seedlings. The enjoyment and pleasing recreation attending the cultivation of florists' flowers add numbers to the fancy.

I have much satisfaction in stating that no flower is more generous in repaying the enthusiastic florist for his labour than the Dahlia.

HOTHOUSES FOR AMATEURS.



THE ample directions given from time to time in the FLORAL WORLD, for the management of small greenhouses, will enable amateurs to keep their collection of plants in good order without much difficulty; but there are doubtless many persons who would prefer a hothouse, but may be deterred from erecting one on account of the supposition that it is more difficult to manage than a greenhouse. I have, however, no doubt that with a little experience and perseverance, any intelligent person will find very little difficulty in the matter; and it must afford gratification to the owner of a small hothouse to produce for his own table, and by his own management, his dish of French beans, new potatoes, strawberries, cucumbers, etc., and also a succession of beautiful flowers all through the winter and early spring months, and in summer a constant supply of melons, a good crop of grapes, and pine-apple occasionally, besides a regular display of hothouse plants in flower. A hothouse for these purposes, of

from twenty-five to thirty feet in length, and twelve feet in width, should have at least four hot-water pipes round the front and both ends. A platform for plants along the front and one end, a pit in the centre for pines, the path to go entirely round it; a strong deal shelf fourteen inches in width fixed on the back wall, three feet by three and a half feet from the glass, and a shorter one across each end. These shelves must be strongly supported with iron brackets, as they will have to bear large heavy pots; and as they will be always exposed to intense sun-heat, they should be made of the very best seasoned timber; shelves of smaller dimensions should also be put up in front for strawberries, etc., and as these will only be in use for a few months, they should be so fixed as to be easily taken down when not in use.

Now, suppose a house of this kind is built and finished in the month of March or April, the first thing to be done is to plant the vines; if it is not convenient to make the border at once, make it five or six feet in width, which will be quite sufficient for the first year, adding a few feet every season till the border reaches its proper width; this plan I consider better in every case than making it all at once. The next thing to be done is to get the pit ready for pines, and to begin to form a collection of flowering plants: of these the following are a few sorts that flower in succession nearly all the year round, and are not liable to the attacks of red spider. For the winter months procure *Euphorbias*, *Poinsettia*, *Plumbago rosea*, *Franciscea*, *Ixorea coccinea*, etc. For early spring, *Gloxinias*, *Gesneras*, *Amaryllises*, etc. For spring and summer, *Amaryllises*, *Achimenes*, *Gardenias*, etc. With a good assortment of the above a constant succession of flowers may be kept up. About the beginning or middle of September, plunge a pot of cucumber seeds in the bark bed, and when the plants appear cover them with a bell glass, to preserve them from woodlice; as soon as the rough leaf begins to appear the plants will be ready to pot off into three or four-inch pots; as the plants will most likely be considerably drawn, carefully coil the stem round the sides of the pot, just leaving the head above the surface of the soil, which should be composed of one half fresh loam, and one half very rotten cow dung, or leaf-mould; plunge the pots again into the bark bed, shading the plants from the sun for two or three days. In the month of October, as soon as the vines are fit to turn out, the house should be well cleaned and washed in every part, and shut up closely, as little or no air will now be wanted. The cucumber plants will now be ready for their final shift into thirteen or fifteen-inch pots. The pots being well drained, fill in with lumps of turfy light soil and very rotten manure, shaking a little finer soil amongst the lumps to make all firm; place the plant deep in the pot, as every part of the stem buried will emit roots into the soil; when all is finished place the pots on the back shelf in the middle of each light to catch the full sun as much as possible; water gently at first, increasing the supply as the plants acquire strength, and never neglect syringing every morning and evening; in training they may be brought forward on to wires stretched across the rafters: my favourite plan is simply to tie them to a single stick, and when

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the plant is about two feet in height, I then stop it; this causes laterals to push out at every joint with fruit on each; these should be stopped one joint before the fruit; as the fruit swells it may be allowed to hang down over the pot, or be tied up to the stick. I find this is the most convenient plan of training, as when the plants come well into bearing they can be taken down and placed on the kerb or back wall of the pine-pit, where they continue to grow and bear quite well, and another lot of younger plants can then be put upon the shelf for succession; by this way of management I find no difficulty in having a continual supply of cucumbers all through the winter and spring, and although I have capital hot water pits, I find it saves me a great deal of trouble to grow the early crops in pots. I very seldom admit air in winter, allowing the thermometer to range from 55° to 90° , as it happens to be sunny or cloudy weather. Melons may be grown exactly in the same way, and in pots of the same size (fifteen inch), only using nothing but pure strong loam to grow them in.

I have just now a crop in pots (the Beechwood), swelling beautifully. I allow only two fruit to each pot, and one plant for the same, giving liquid manure freely when the fruit is swelling; it will thus be seen how this part of the house may be turned to account, where in nine cases out of ten, it is to be seen empty and, of course, useless. If it happens I am short of young cucumber plants, I turn out the old plants that have borne a crop, reduce the ball, and repot them, coiling the old stems down, and leaving a young shoot just above the soil. An old plant managed in this way will grow and bear quite as well as young plants.

A few ash-leaf kidney potatoes may also, in October, be potted (nine inch pots), and placed on the shelves; and, by continuing to pot a few every three weeks, will keep up a succession.

French beans may also be started in November, strawberries in February on the front shelf, and melons may also now be sown to take the place of the cucumbers, if there should be any convenience for growing the latter out of doors; in March the vines will require to be brought into the house, when the temperature must be lowered for a few weeks; yet if the cucumbers, etc., are kept free from insects, and are in good health, they will scarcely feel the change. In the management of a hothouse there is one thing to be most particularly borne in remembrance, viz., never to crowd plants—always leave plenty of room for everything to grow and thrive; better to have a “little and often,” than a great deal and then none. If I may presume to give advice to amateurs on another point, I would just observe, that the quickest and most economical, as well as the most complete knowledge to be acquired how to manage, as well as to build a hothouse, is to consult an experienced practical gardener; to trust neither to his own judgment nor that of any other person inexperienced in practical horticulture, but to take the advice of a clever gardener, both in building and management, and to abide by it; by so doing he will not only save himself trouble and expense, but will gain more experience in six months than he will do by books in six years.

TREATMENT OF ORCHIDS.



OW that the nature and the habits of Orchidaceous plants are better known than they were some few years ago, we have become acquainted with the conditions of their growth in the countries where they are indigenous. Here they are exposed to a dry season, during which they are at rest; and to a rainy season, when the heat is higher, and the air moist nearly to saturation. And to grow orchids in any perfection, their native climate must, to a certain extent, be imitated, viz., they must have a period of rest in a dry and comparatively cool atmosphere, and during their growth and flowering they should be exposed to a high moist atmosphere; but as they principally grow on the trunks and branches of trees, it is important that they should be exposed to a free current of air, and also to the light. This is essential, except in some few species, to prevent the plants being exposed to the direct action of the sun's rays, which is apt to scorch the leaves. The great heat and moisture is only necessary during the time the plants are in vigorous growth, and this period should be during spring and summer, the best periods of rest being from about November till February; and it is the long period of rest which predisposes the plant to blossom. Of course, the rules as to the periods of growth and rest can only be stated in general terms. There are certain kinds which do not stop growing, to some extent, all the year round. And again, even of those which do go to rest periodically, on the completion of their growth, it does not always happen that the time of rest corresponds with that time at which the largest numbers go to rest.

When the growing season commences, raise the temperature of the East India house to 65° by night and 70° by day. By sun heat it may be allowed to range to 75° , and as the days lengthen, so the temperature may be permitted to increase; and during the months of May, June, July, and August, it should range from 70° to 75° by night, and from 75° to 80° by day, and by sun heat to 85° , or even 90° . This will not do any harm, provided the plants are shaded from the direct rays of the sun. The Mexican house should be 60° by night, and from 65° to 70° by day; and as the days lengthen, so the temperature may be allowed to increase, and during the months of May, June, July, and August, the night heat may range from 65° to 70° , and by day from 70° to 85° . Great attention should at the same time be paid to the state of the atmosphere, as regards moisture. At all times of the year this is of much importance to the successful growth of the plants, for they derive the greater part of their subsistence from the moisture in the air, so that wherever any plants are growing, the atmosphere should be well supplied with moisture. This is obtained by pouring water over the tables, walls, and paths of the house every morning and afternoon, and by keeping the hot-water tanks full, which will cause a nice gentle steam to rise, which is of especial value whilst the plants are in a vigorous state of growth, especially as regards the

East Indian Orchids, such as *Aerides*, *Saccolabiums*, *Vandas*, *Phalenopsis*, *Dendrobiums*, and many others requiring a high temperature, with a considerable degree of moisture. The Mexican Orchids, most of which come from a cooler climate, not so saturated with water, of course require less heat and moisture, but these should have a considerable degree of warmth during their growing season.

Water should be administered with great care, especially in the case of plants just starting into growth, as, if watered too profusely, the young shoots are apt to be affected by the moisture of the house and by what is termed damping off; whilst, therefore, the shoots are young, only enough of water should be given as is sufficient to keep the peat in which the plants are grown moist. As they advance in growth, more may be given; and when the pseudo bulbs are about half grown, they may have a good supply at the roots. My practice is to shut up the house, in the spring of the year, about three o'clock; and in May, June, July, August, and September, I shut it up about an hour later, when the heat of the sun is on the decline. I then usually give a gentle syringing with water as nearly as may be of the same temperature as that of the house. In fine weather, the temperature from sun heat will increase frequently as high as 95°, or even more, but I never have experienced any injury from this, so long as the house was saturated with moisture, in which case there is no fear of any injury to the plants. The house should be dried up once a day, if possible, by means of ventilation. In syringing, be careful not to wet the young shoots too much. The syringe should be furnished with a fine rose, so as to cause the water to fall on the plants in imitation of a gentle, fine shower of rain; but this syringing should only be done after a hot summer's day. Those plants which are growing on blocks of wood should be syringed twice a day in the summer time; and I also find it a good method, during the growing season, to take the blocks down and dip them in water till the wood and moss are thoroughly soaked in water. This is also a good mode of getting rid of many insects that harbour in the moss, such as the woodlouse and cockroach; when the moss is soaked, they will come to the top, and then they may be easily killed. Rain or pond water is the best.

Among orchids, some are termed terrestrial, by reason of their growing in earth; such are the plants of the genera *Phaius*, *Calanthe*, *Bletia*, *Cyrtopodium*, *Cypripedium*, etc.—all derive nourishment from the ground. Epiphytes, the other great class, inhabit trees, from which, however, they derive little or no nourishment. These are by far the most numerous and most interesting. They are found adhering to the arms of living trees, whilst some of them delight in very elevated situations upon high trees. Others, again, grow upon low trees, some on rocks and mountains, some on trees overhanging a river, and some near dripping rocks; the latter, of course, require a particularly damp atmosphere to grow in. Others are found in woods, where scarcely any sun can penetrate; these like a shady, moist atmosphere, whilst those in more elevated situations do not need so much shade as the last. A knowledge of

the different habitats of the various species is essential to the careful grower, so that he may, as far as his means permit, imitate their natural mode of growth; and it is, perhaps, to some inattention to this point that the want of success in the culture of some of the orchidaceous plants, by even the most successful of our cultivators, is to be attributed.

When the season of rest is over, many kinds will require re-potting, but I have not confined my practice to that time only; no season can be determined on absolutely as the proper one for this operation. The months of February and March are the best time to pot some of them; that is, after the resting season. Those that do not need potting should be top dressed with good fibrous peat, removing the old soil from the top without breaking the root of the plants. This also affords the means of getting rid of many insects which harbour in the old soil. The pots should be thoroughly cleansed from the mould, moss, and dirt too often seen covering those in which orchids are growing. Previously to potting the plants, they should not receive any water for four or five days. Some, however, should be potted at a period somewhat later, viz., just as they begin to grow. All the species of the genera, *Phaius*, *Calanthe*, *Dendrobium*, *Stanhopea*, *Cyrtopodium*, *Brassia*, *Miltonia*, *Sobralia*, *Bletia*, *Oncidium*, and many others, require this treatment. *Lælias*, *Cattleyas*, *Saccolabiums*, *Aerides*, *Vandas*, and similar plants, should be potted just before the commencement of their growing season. The chief point to be attended to in all potting is that the pots be well drained; the best material for drainage is potsherds or charcoal. Before potting, be particular to have the pots perfectly clean inside and out, and the broken potsherds should be washed. After this is done, select a pot according to the size of the plant; do not give them too much pot-room.

Some plants will require shifting once a year; others it will not be necessary to shift oftener than once in two or three years; but if a plant becomes sickly or soddened with wet, the best way to bring it into a healthy state is to turn it out of the pot or basket, and wash the roots carefully with some clean water, cutting off such of the fibres as are dead; then to repot it, not giving it much water till the plant begins to make fresh roots. The best pots are those in ordinary use. Some employ slate pots, but they are not, in my opinion, so good for orchids as those made of clay. In potting large plants, there should be a small pot put in the bottom of the large one. Then fill in with potsherds or charcoal broken up into pieces about two inches square for large plants; smaller plants should not have pieces so large. Then introduce potsherds till within three or four inches of the rim, and afterwards put in a layer of moss to prevent the peat from impeding the drainage, and to let the water pass off quickly. This is of great importance, and if it is not attended to, the water will become stagnant, and the soil sodden, which is fatal to the growth of the plant. The grand point to be observed in the successful culture of orchids, as well as of other plants, is good drainage; without that, it is hopeless to keep the plants long in a healthy condition. The best material for potting the

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different kinds of Epiphytes is in good, rough fibrous peat, and sphagnum moss ; after this, a layer of moss is applied, then fill up with peat. This should be broken into lumps about the size of a hen's egg ; I always use broken potsherds or charcoal mixed with the peat. The plants should be elevated above the rim of the pot two or three inches, taking care to have all the pseudo-bulbs above the soil ; then put some peat on the top of the roots so as to cover them, employing a few small pegs to keep the soil firmly on the pot.

After the plants are potted, I fix a stick in the centre of the plant, to keep it firm. In shifting, I carefully shake off all the old soil I can without injuring the roots. Be careful not to give too much water at first ; but after the plants begin to make more root, they may have a good supply. The best material for those in baskets is sphagnum moss and broken potsherds. The basket should suit the size of the plant ; but do not have it too large, for it will not last more than two or three years, at which time, probably, the plant will require shifting into a larger one. There should be placed a layer of moss at the bottom of the basket, then a few potsherds, then fill up with moss and potsherds mixed. Take the plants carefully out of the old basket, without breaking the roots, shake off all old moss, place the plant on the new material, about level with the top of the basket ; put a stick in the centre, to keep it firm, and finish by giving a gentle watering. Those plants that require wood to grow upon should have moss attached to the blocks, if by experience they are found to require it ; some, however, do better on bare blocks ; but then they need more moisture, as they are then entirely dependent on what is obtained from the atmosphere. In fastening them firmly on the blocks, have some copper nails, and drive them into the block, then with copper wire secure the plants firmly in the wood. As soon as they make fresh roots they will cling to the block, and the wire may be taken away.

Terrestrial orchids require a stronger compost than the epiphytal kinds. They should be potted just when they begin to grow, after the resting season ; they do not need so much drainage as Epiphytes. The compost I use for them is turfy loam, chopped into pieces about the size of a walnut, leaf-mould, and a little rotten cow-dung ; these are all mixed well together. The plants require a good-sized pot. Put about two inches of drainage at the bottom, on that a layer of moss, then some of the rough peat, and finish with the compost above-mentioned. Place the plant one inch below the rim of the pot, water sparingly at first, but when the plants are about six inches high they may have a good supply.

LILY OF THE VALLEY.



ALTHOUGH this is only a common English plant, there is, perhaps, no greater favourite than it is, more especially with the fair sex, nor any more deservedly so; its beautiful foliage, lovely white smart-looking flowers, and delicious perfume, all conspiring to make it an object worthy of general admiration.

For many years I have made a practice of growing a few pots of it, for the purpose of winter and spring decoration of the drawing-room, as well as the conservatory. They are generally grown in six-inch pots, and the average number of flower-spikes have been from two to two and a half dozen, though they sometimes amount to above three dozen to each pot; and most people who see them through the months of February, March, and April, are in raptures with their loveliness, particularly those from the neighbourhood of towns. I have heard but few people say that they cannot grow them, but almost everybody complains that they cannot get them to bloom well; and from what I have seen of their culture, I might say that the fault lies in taking too much trouble with them; indeed, their cultivation is so simple, that I have often thought that it would be almost the best thing a cottager or dweller in a town could have for a window plant in spring and early summer. The only thing required is to provide a few five or six-inch pots, and a few eyes, about the beginning of March; just as the eyes begin to show above ground a little rather light sandy loam should be placed in the pots, upon about half an inch of drainage; seven or eight should then be placed equidistant about the pot, on the surface of the soil, allowing the eyes to be about level with the rim of the pot. A handful or two of the finest of the soil should then be placed on the top of the plants, and a good shake of the pot, by striking the bottom of it against the ground a few times completes the work; plunge the pots as closely together as is convenient, in tan or ashes, or in the garden soil, in a situation where they can have the full sun for a few weeks. About the middle of April or beginning of May remove them to a situation where they may be partially shaded; the north side of a low deciduous hedge is a capital place, but they must be kept plunged. They will require no more care than a little water now and then till September, when a coat of about six or seven inches of rotten manure may be thrown over them. The rains will carry the fertilizing matter from the manure gradually through the soil amongst the roots; and if you force them they may be taken up about six or seven weeks before they are wanted in bloom, and started at once in a very mild heat—say 55° by day, and from 45° to 50° by night. Another portion may be placed in a vinery not at work, or in a cold pit, and introduced to the forcing-house at intervals, and those left in the cold house will be in bloom all through the month of April. If they are wanted later, it is effected by placing them behind a wall with a north aspect; by this means they might be had in bloom from January till the middle of June.

May.

When done flowering, if very early, they must be put somewhere that will afford them full sun and protection from frost ; but any that bloom in April will do very well plunged in a sunny sheltered place out of doors, and removed to the same quarters for summer and winter as before recommended. If grown by the cottager, or where there is no convenience for forcing them, they may be taken at once out of the plunging material and placed in the warmest corner of a south window, where the sun can play full on the outside of the pot, and when they have shot up about an inch or two, a pan may be placed under them with a little water in it, which should be quite used up before any more is added. When in bloom they require plenty of water.

Now all this is very simple, and some may say scarcely worth a place in your columns ; and indeed, I believe that the only secret in their management is to keep the same plants in the same pots and never shake them out, never cut them down (that is, never make a clean "shave" of all the top, as I have sometimes seen done to the destruction of strawberries, asparagus, lilies, etc.), and always take care to well mould them before winter, covering up dead tops and all. If any strings remain of the last year's foliage, they can easily be pulled off in spring. The specimen you lately received from me had been potted at least ten years, and although there had been perhaps a dozen flowers with two leaves attached cut from it every year for the last seven or eight years, it has never been cut over for the sake of tidiness, and never been shaken out or repotted. I generally find that they bloom strongest when they have been potted three or four years ; and so far from being injured by forcing they absolutely grow, I should say, at least twice as large as any I ever saw in the open air ; the two spikes of cut bloom that accompanied the plant I sent for your inspection were grown on the top of a flue in an intermediate house, and cut from a plant in a six-inch pot, containing twenty-nine spikes of bloom. Some plants I shifted into larger pots last year have bloomed very finely, but they are not so ornamental as when they perfectly fill the pot to the rim. Their value as a shrubby plant need not be dilated on here, as everybody has seen them growing perfectly wild ; but some are of opinion that a portion of manure strewed over them every autumn would much enhance their beauty at the proper season.

FRANCISCEA CONFERTIFLORA.



THIS fine stove plant is not so generally cultivated as it deserves to be. Its great heads of pale blue or lilac flowers, each measuring an inch and a half across, when produced in profusion, have a really striking effect, and they last a long time in perfection. Its cultivation does not differ much from that of other varieties ; a temperature of from 60° to 70° during active growth, suitable soil, water, and general cleanliness, are all that is required to ensure success.

Young plants of it may now be bought in from nurseries at a moderate price. After they are received, place them for a few days in a close, warm situation, in order that they may recover from any injurious exposure to which they may have been subjected during removal. Then, if well rooted, and otherwise healthy, and in a growing condition, give a moderate shift into well-drained pots, one or (in the case of strong plants) two sizes larger than those they are in. After potting remove them to a close, warm pit or frame, where a moderate bottom-heat is maintained, and keep a moist atmosphere around them, giving gentle waterings as required, and a slight shading during bright, sunny days, the foliage being liable to burn in a close atmosphere. When growth has commenced freely the young shoots should be stopped at a well-placed joint.

After the buds have again started strongly, which will soon be the case if the roots have made good progress, a second shift should be given into larger pots, proportioned to the strength of the plants, and they should be again placed in heat. They should receive every encouragement to make vigorous growth, so as to get the wood ripened well by the end of September, after which a drier and cooler atmosphere is requisite to ensure a period of rest. A temperature of from 50° to 55° is most suitable during winter, water being given sparingly, but in sufficient quantity to prevent the foliage being injured by a long period of drought. If fair-sized specimens are wished for, the plants should be pruned back a few joints in February or March, and after the wounds are healed, placed in heat as before, to start them into growth; but if bloom is desired this season, pruning must be deferred, as the flowers are produced on the points of last year's wood. Blossoming, in a small state, however, considerably weakens the plant, and I therefore prefer growing it a second season, before it is permitted to flower. If pruned, as already stated, and placed in heat, the buds will break kindly, and the plants may then receive a shift into the pots in which they are destined to bloom in the following season. Previous to repotting, carefully examine the ball and remove any impure soil, drainage, etc. The pots now used may be from twelve to fifteen inches in diameter, and they should be well drained. In the progress of growth the shoots should be once or more stopped if necessary, and neatly tied out, to allow light and air to reach the inside branches. The former operation should be completed as early in the season as is consistent with the formation of a well-shaped plant. This will allow more time for the production of robust, well ripened wood for the next year's bloom. The winter treatment may then be the same as before.

The period at which the flowers would be most desirable must influence the time of commencing to force the plants. If started in January they will be in bloom in March or the early part of April, or they may be retarded for a considerable period. When the flowers begin to expand, a cooler and drier atmosphere will preserve them for a length of time in perfection. After this period the plants will require judicious pruning, repotting if necessary, and otherwise treatment like that previously given them. By timely attention, in

potting, pruning, etc., as may be expedient, they will continue to increase the size and beauty for many years.

Cuttings of this plant root freely, if young half-ripened shoots are taken off for the purpose during summer. They should be inserted in silver sand in a well-drained pot, covered with a bell-glass, and placed in heat. They will root in five or six weeks, and if potted then into four-inch pots, they will make nice plants for the ensuing spring. The soil I find best adapted for it is two-thirds fibrous peat and one-third good turfy loam, with a liberal addition of silver sand; the two former should be broken into small lumps, but not sifted, except for young plants. In potting large specimens, it is advisable to add a liberal supply of potsherds to the soil, or wood charcoal, broken to the size of a small nut. This will assist in preserving the ball in a healthy, open condition.

If those pests, mealy bug or brown scale make their appearance, lose no time in clearing them off. With early and careful attention, the habit of the plant affords small chance of safe retreat for these unwelcome visitors.

THE POLYANTHUS.



AMONG the whole range of florist's flowers, not one is of more easy cultivation than the Polyanthus; and yet I know that I rightly tell the experience of the majority of florists when I say, that with no flower have they generally been less successful. The great fault lies in the fruitless attempt to grow it in pots. It is not difficult to account for its impatience of pot culture, which is, perhaps, referable to several causes. Thus, when so circumstanced, it is subjected to a lack of that degree of moisture so acceptable to it; which may arise from inattention to watering, lightness of soil, or drying of the pots. It may in part depend on the cramping of its roots; for the Polyanthus grown in the open border is most prolific of long, thick, fleshy, fibrous roots. But chiefly, I conceive, it is dependent on the confinement within the cold frame, which no attention to airing can obviate, inducing a paleness and softness in the leaves and flower-stem, strongly contrasting with the firm, crisp, yet succulent and luxuriant green foliage of those which are grown in the open bed. The only sure guidance in the artificial cultivation of a plant is the observance of its natural condition and habitat. And where grows the primrose in its wild luxuriance but in the shaded lane or woodland? And though it is sometimes seen to adorn, in the spring, the sunny bank of a hedgerow, yet, ere the summer's sun can visit it, even there it will be found that Flora has kindly sheltered her favourite amid the shadowing growth of others of her train. The Polyanthus, then, should always be grown in a cool bed, or open border, which has an eastern aspect, or which is otherwise wholly shaded from the summer's sun, for it is most impatient of heat and drought, and, it may be added, of confinement and smoke also; and

hence it can never be well grown in the immediate vicinity of large towns. Good and retentive sod soil from old pasture, of this four parts, enriched with the other part of old cow manure, and two of decaying leaves or rough vegetable mould, afford it the most acceptable medium of growth. Though the leaf-mould is not wholly necessary, yet it will ever be found, both in respect to the *Auricula* and *Polyanthus*, that wherever there occurs in the soil a little mass of decaying leaves and sticks, there the roots will be most numerous and vigorous. Such practical hints or natural tendencies the observant florist ever treasures up, and it is by their observation and application that he becomes a more successful cultivator than his fellows.

Now, the above advice is admirable for persons who may probably have a garden possessing any situation they may think proper to choose for their favourites; but I am confined to a small rectangular slip, bounded by low walls, and therefore I have to suit my practice to my position. I am ever anxious to have the greatest display I possibly can in *all* my borders, be they shady or not, in early spring, and therefore, as *Polyanthuses* are well adapted for my purpose, I plant them plentifully all round my garden in autumn, after my bedding plants are removed; they stand there all the winter, requiring no protection, and in spring they come into bloom beautifully. This season they have been, and are still, quite the admiration of all who have seen them. As soon as they have done blooming I move them to a shady corner, where I keep them all the summer, and by autumn they are in good condition for transplanting again into the open borders.

Such, then, is the treatment I give this my favourite spring flower. If required for the purpose of exhibition, or for ornamenting a cool, airy greenhouse, or even a cold frame, they may readily be taken up with a ball of earth without injury, and potted, being at the same time liberally supplied with water. When no longer required for such purposes, they must be returned to their summer quarters.

PLANTING THE BEDS FOR SUMMER.



HAVING decided of what your stock of summer flowers shall consist, and where you will place them, a few directions on the subject of planting may be useful. If you have your plants *de novo* from a nursery, they should by all means be in pots; either purchased so, or potted by yourself. A great number of handsome flowers may be procured for a small sum, unpotted; and if you put one of each kind in a small pot, and shade them for a day or two in a cold frame, they will soon be established. You will thus have your plants ready for turning out when the season suits and the beds are ready, without the risk of losing them by drought and sunshine—the great

enemies of plants—to be removed to their destinations without the process of potting. The soil for flowers should not be made rich with exciting manures, which have the effect of producing a luxuriant foliage at the expense of the bloom. Rotten leaves do better than anything else to mix with the soil, which need not be very deep. Having some very large scarlet pelargoniums, I intend this season to bury the pots in the beds, instead of turning the plants out, expecting in this way to secure more flowers. Good drainage is necessary, and a few crocks may be advantageously put into each hole under the plants. Calculate well your distances, for nothing is more common than to injure future effect by planting too close. If the object is to cover a bed with one kind of flower, the distance is no object; but for single plants allowance should be made, so that, when full grown, a little space may exist between each. Training should begin at once, by pegging down the trailers, and putting neat sticks to those requiring support. Remember that it is not always good policy to allow a plant to bloom when and where it pleases. A strong shoot showing bloom may often be removed with advantage; other shoots will thus be encouraged. Occasional stopping, by pinching off the ends of the shoots, will induce a more compact growth and regular bloom.

The time for placing the plants in the open air should be carefully studied. It is dangerous in our climate to presume that frosts are over till the middle of May; and even then the nights should be watched, as a destructive rime has often appeared at the close of that month. If your garden is small, and you do not mind trouble, you may fill your beds now, provided you give protection at night by covering with flower-pots or otherwise. You will in this way get your beds in summer order earlier; but if you cannot do this, be patient. Take the advice of a sufferer, and stop till the last week of May. It is most provoking to find, some clear, sunny morning, your tender pets blackened, and even the more hardy ones turned to a dingy brown by a frost. With a little management, you can carry on the growth of your stock in pots, so that you will not, after all, be a loser by waiting. In this case, you must retard some and forward others. See that none get pot-bound, and that flagging is prevented by a proper supply of water.

A frame full of plants demands much watching in this respect, or some bright, warm day will deprive small pots of their moisture, and injure them very much. Where your beds are now occupied by tulips and other bulbs, your plan of operations must vary according to the treatment you propose to give the bulbs. If you intend to allow them to remain in the ground, you can insert your summer plants among the foliage, removing the latter as it decays. But if you wish to remove the bulbs, it will not do to hurry them, for on the duration of their leaves their health and strength depend. By taking them up with the soil adhering to them, and putting them into the ground again in some other spot, the leaves will still do their duty, and the beds they occupied may receive their summer ornaments.

THE MANAGEMENT OF PEACH TREES.

BY A SUBSCRIBER.



IN the management of the Peach, it must be borne in mind that the Peach is a native of Persia, whose climate is hotter than that of Britain; and in order to grow it well, it must have a favourable situation, good aspect, soil, and drainage. The most important of these is situation; if this can be provided, the gardener will have overcome his great difficulty; for any locality will furnish a suitable aspect, the best of which is that facing the south, or if slightly inclined towards the east, so much the better. The Peach should not be situated so high as to be injured by cutting winds, nor so low as to render the tree liable to be hurt by spring and summer frosts. The precise course to be followed, however, must be influenced by the circumstances under which the trees are placed rather than by any fixed rule. In Cornwall it is easier to produce good fruit under the most ordinary treatment, than it is in some localities to produce fruit of even second-rate quality under the most skilful management; and why? because the climate of Cornwall is most suitable to the nature of the Peach. I have been convinced by experience of this truth. The summers of Cornwall are sufficiently long to allow of the wood being thoroughly matured, and the average temperature there is less variable. The garden of which I lately had charge, was situated at the bottom of a wide and beautiful valley in Shropshire, on the banks of the River Corve. Here the trees suffered so much from the effects of late and early frosts, that it was only in fine hot seasons the wood ripened.

Spring and summer frosts are the worst enemies a gardener has to contend with in Peach growing, and any locality susceptible of frosts early in autumn must be highly injurious to Peaches, causing the leaves to fall before they have discharged the duties of their office, the buds in their axils are left unripened, and the shoots on which they grow are green and full of unelaborated sap. In such a state they cannot be expected to bear with impunity the rigour of a severe winter. There should be flued walls in all treacherous situations in order that the ripening process of the wood might be assisted by artificial means, whenever circumstances required it. As a proof that climate much affects the Peach, I may state that the fruit produced in the houses in my locality were equal to any I ever saw. The late Mr. Knight predicted that peaches and nectarines would never do any good in situations like that alluded to, and experience confirms the truth of his predictions. I do not mean to say that there were no fruit produced in the place I have mentioned, but I can say that it was inferior and deficient of that sugary flavour so essential to the quality of the Peach. I have no doubt, however, but that Peaches might have been grown pretty successfully at a slight elevation on the south side of the valley.

Had I continued in the situation I was in, I would have tried the

May.

effects of raising the borders to a height that would have allowed me to place the roots of the trees above the common level of the garden. My object in doing this would been to keep the roots within the reach of sun and air ; it would have promoted a more healthy action between the roots and leaves ; success depends entirely on the perfect balance of this action.

The next point to be considered is the soil. That most suitable for Peaches is friable loam, of naturally good quality ; it is far preferable to ordinary soils enriched by manures, for such materials decompose rapidly, and supply the plant with food faster than is necessary for its perfect development, and gross luxuriance is the consequence. It is on this account that so many have insisted on the superiority of turves from old pastures, as they contain all the constituents the plant requires. They decompose slowly, and continue to supply the wants of the plants with suitable food longer than any other material provided the border is effectually drained. Too much importance cannot be attached to drainage ; it increases the productive powers of the soil, and, by the admission of air to the roots, they are enabled to decompose and take up those earthy and organic matters essential to their growth. In order to secure the thorough drainage of Peach borders I put down a drain parallel with the wall, and not less than three feet in depth, with outlets in every drain that would be brought into communication with it. The width of my borders I could regulate according to the height of the wall ; for a wall of ten feet in height, I would have an eight-feet border ; but for a twelve feet wall, I should add two feet more to the border. I should prefer trained trees from a nursery to maiden ones, as they are thoroughly prepared for the final plantation. If the soil is good and friable, I would select trees worked on their own stocks. If it was very stiff, I would give the plum stock the preference. The fruit grown on the natural stock is of the best quality, but smaller than that produced on the plum stock. I must again quote the remarks of Mr. Knight on this subject ; he says that his garden contained two trees of the Acton Scott variety, one growing on its native stock, the other on the plum stock. The soil being similar, and the aspect the same, that growing on the plum stock produced fruit of a larger size, and its colour, where it was exposed to the sun, was much more red, but its pulp was more coarse, and its flavour so inferior, that he would have denied the identity of the variety had he not, with his own hand, inserted the buds from which both sprang. I would, however, in all cases, adopt such means as would be most likely to answer the desired end ; I would keep the roots as near the surface as possible, that they might have all the air and solar heat they could get. Roots so situated generally produce healthy branches and good fruit. The most approved system of training is the fan, on account of its allowing the sap to be more equally distributed. The beauty of trees so trained depends on the treatment they receive in their earlier stages. The shoots made in the second and third year after budding are the principal branches of the tree—then is the time to lay the foundation of a well-trained tree, it cannot be done afterwards ; I would take care that no more shoots remained on

one side of the tree than on the other. Although the fan admits of the most equal distribution of sap, yet all branches do not receive the same amount of it; those most vertical receive a greater supply than those below them, therefore crop according to the position of the branches. The most vertical shoots should carry the most fruit. Disbudding a summer pruning should be gradually persevered in until there remained only as much wood as was necessary for the winter pruning. This will allow the leaves and shoots the free benefit of sun and air. In winter the trees should be unnailed, to retard the flowering period as much as possible. Pruning in severe frosty weather should be avoided, and wherever shortening was required I would cut at a wood bud. After this the shoots should be again nailed to the wall.

A short time before the blooms expand, the trees should receive some protection. If the fruit sets in greater numbers than is required, a portion should now and then be removed, until only about a tenth more remained than would be necessary for the crop. The latter are left as a guard against accidents. I have noticed that the finest fruit is situated at the base of the young shoots, which must be pinched at about six inches beyond it; if this is not done the organic matter that should go to the increase of the fruit will be appropriated by the shoot. I would dispense with cropping the borders as much as possible, and on no account would I have borders dug with spades, as the most valuable roots belonging to a tree are those nearest the surface, and such roots would be destroyed. All plants exhaust soils, therefore it will become necessary to manure the border with thoroughly decomposed manures when the trees have attained a good bearing state; the most troublesome pests to which Peach trees are subject are green-fly and mildew; the former may easily be destroyed by syringing with tobacco-water, after the rate of two ounces to the gallon, and the latter can be got rid of by dusting with sulphur while the trees are wet with dew.

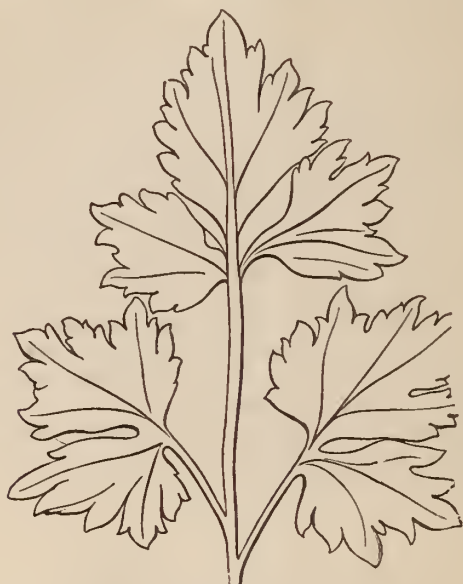
WILD FLOWERS OF MAY.



THAT particular flower was in the minds of those who contributed somewhat to the founding of the great American republic by naming a ship that afterwards became famous, the "May Flower?" A pretty query that, perhaps, for the speculative, but a narrow one, for doubtless if we are to select a flower and call it *the* May flower with emphasis, it must be either the buttercup or the hawthorn. These are pre-eminently flowers of May. It would seem as if we had been transported unawares to some other planet if we did not see either of them in the course of the merry month. "This is indeed the "merry month" when bees from flower to flower do hum," and the gold of the meadows and the snow of the hedge-rows help materially in the excitement of its merriment. The fields are full of buttercups, and

those ambitious botanists who have not yet made a beginning in systematic study, may advantageously begin now, for the buttercups have this post of honour in the "natural system"—that they constitute the first order; and the student must master the characteristics of the buttercups in respect of structure and relationships, as the very first step towards a systematic knowledge of plants.

The many systems of botany may be reducible to two for our present purpose. The Linnæan, or Artificial system, is simply not a system of botany at all: it is a system of botanical mnemonics. The classes and orders are founded on the numbers of the stamens and pistils, and on some few other purely mechanical or numerical characteristics of the organs of reproduction. The system itself may

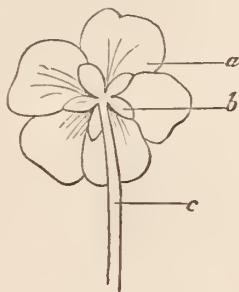


LEAF OF COMMON BUTTERCUP (*Ranunculus repens*).

be mastered in an hour by any mind of ordinary capacity; but to apply it is another matter, as the application consists in the practical study of plants—a study in which the system affords absolutely no help at all. Several of the Linnæan classes and orders have better conditions of cohesion than mere mechanical and numerical signs can afford, but that is, so far as the system is concerned, an accident and not a merit. Thus, in the Linnæan system nearly all the grasses come together in Class III., Orders 1 and 2, having three stamens and one or two pistils. But the sweet-scented vernal grass has a place in Class II., Order 2, having two stamens and two pistils. There are many exceptions of like nature, but the system must not be blamed on their account, for it does not profess to do more than

find a pigeon-hole for every plant on the face of the earth ; and if plants closely related get into pigeon-holes far apart it cannot be helped, and at all events we know where to find them whenever they are needed for a better arrangement.

Now this better arrangement the Natural system purposes to effect by grouping plants in orders, families, classes and so forth, according to their obvious affinities, so far as those affinities can be understood. Thus, to begin with, it is a sensible procedure to group all the buttercups in one order, and, as above remarked, in all the now-accepted natural systems, the *Ranunculaceæ*, the buttercup or crowfoot tribe, constitute the first order, and the one which therefore demands the first attention of the student. In this order we find the buttercups, the clematisses, the anemones, the adonis, the globe flowers, the hellebores, the columbines, the larkspurs, the aconites, the pæonies, and a few other less important tribes. They



BACK VIEW OF BLOSSOM OF COMMON BUTTERCUP.

(*Ranunculus repens*),

a, petal ; b, flower-cup, in five sections ; c, peduncle.

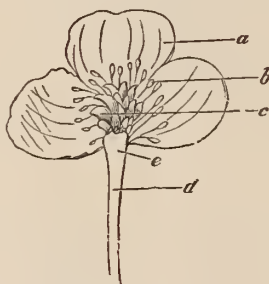
are grouped under *Ranunculaceæ* because of certain properties which they have in common. Thus the flower of any one of them has usually a calyx of five or six sepals ; a corolla of five or six petals ; many stamens inserted *on* the receptacle ; many ovaries ; watery (as distinct from milky) juice ; acrid and poisonous properties. You may judge by these few particulars that in the study of the natural system every separate fact becomes in its turn a key, a royal road, a finger-post, or a magnetic telegraph to some other fact, or perhaps to a bigger bundle of facts than the memory can catch hold of at a first effort, though they may be most clearly brought before it by the aid of principles that appear to be irrefragable. We must not, however, consider it a fault of the natural system that it offers us at every intellectual meal more than we can hope to digest, because we might apply that principle to material things, and blame the butcher if he ever sent a joint in which there was an ounce of meat more than could be eaten at one sitting.

We have many more species of crowfoots than the beginner in botany would imagine. The most plentiful of all is the Creeping

May.

Buttercup, *Ranunculus repens*, the buttercup of the meadows. The leaves near the root are marked with a dark spot in the centre, the flowers are glossy and plentiful, and of the fullest tint of yellow, the root is fibrous, with a tuberous base, and from the base of the stem go forth many creeping scions which put out roots from the joints.

The following species of ranunculus are worth hunting for now. The Ivy-leaved Crowfoot, *Ranunculus hederacea*, showing [its first flowers late in the month in marshy places. The leaves are kidney-shaped; the flowers white; the stem puts out roots at almost every joint. The Water Crowfoot, *R. aquatilis*, is well known; but if you never once noticed it, you have but to look out for its white flowers on rivers and ponds to make sure of knowing it the first time you see it. The leaves that lie on the surface of the water are boldly lobed; those that are submerged are cut into fine divisions like curly hairs of a dark green colour. The Floating-water Crowfoot, *R. fluitans*, which resembles the last in habit, but differs in having its leaves much elongated and divided, and the stem very



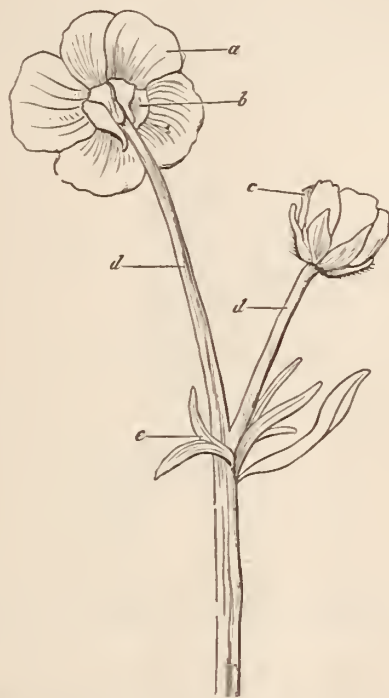
SECTION OF BUTTERCUP BLOSSOM.

a, petal; b, stamens; c, pistils; d, flower-stem, or peduncle;
e, receptacle.

long and round. The flowers are white. The Lesser Spear-wort, *R. flammula*, another of the marsh-inhabiting species, varies much in character, but always produces many yellow flowers and leaves that vary in form from linear to ovate, very different indeed to the leaves of the meadow buttercups. The Wood Crowfoot, Goldilocks, or Golden-haired buttercup, *R. Auricomus*, inhabits woods and shady places, producing a few yellow flowers and two sorts of leaves; those at the base roundish, heart-shaped, and thrice divided; those on the stem cut into linear segments—or say—resembling fingers. The Upright Meadow Crowfoot, *R. acris*, produces an abundance of beautiful yellow flowers, which contribute largely now to the splendour of the pastures. It is a true buttercup, with fibrous root, a stem one to two feet high, and hairy leaves deeply lobed and cut. The Creeping Crowfoot, *R. repens*, is extremely common in pasture and waste places; the radical leaves are usually stained

black or brown in the centre ; the flowers are numerous, and of a beautiful golden colour. The Bulbous Crowfoot, *R. bulbosus*, is the "buttercup" *par excellence*, the most plentiful species of all. The root is usually of a grey colour, and resembles in form and size a turnip radish. The flowers are large, and, of course, of a bright golden yellow.

The anemones are, as noted above, members of the ranunculaceous order, and very like a ranunculus, too, in aspect, is the Yellow Wood Anemone, *Anemone ranunculoides*, but the flower is



FLOWER OF BULBOUS-ROOTED RANUNCULUS, BACK VIEW.

a, petals of expanded blossoms ; *b*, reflexed calyx, or flower-cup ; *c*, blossom half expanded, the flower-cup not yet turned back ; *d*, peduncle, or flower-stem ; *e*, bract or flower-leaf.

starlike in form, and resembles somewhat that of the *Ficaria*. This, however, is a scarce species.

Very plentiful is the common Wood Anemone, *A. nemerosa*, with its tripartite leaves and pretty white or pale pink flowers.

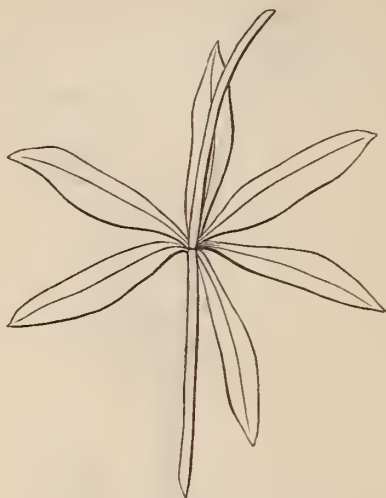
The Blue Mountain Anemone, *A. apennina*, is a questionable native, and more likely to be found in the choice garden where hardy plants are valued, than on any of our mountain ranges ; but

May.

it is recorded to have been found near Berkhamstead, Herts, and near Luton Hoo in Bedfordshire.

The Pasque Flower, *A. pulsatilla*, is not plentiful, but somewhat widely distributed; so a search for it on a chalk-down, or dry pasture, may not prove a mere wild-goose chase. It may be instantly known by the merest novice, so distinct is it in character; the flower bell-shaped, and of a dull violet hue, the leaves all springing from the root, and cut into narrow segments. It is but a step from these to the Pheasant's Eye, or Corn Adonis, *Adonis autumnalis*, which begins to flower during May in the open fields, and will continue flowering until October.

It is impossible to hunt in a good country now without finding some of our native orchids, the characters of which will perhaps



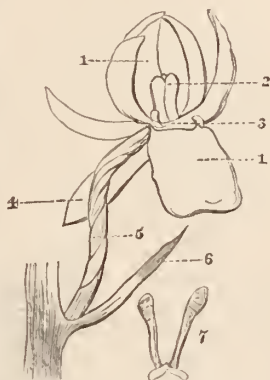
LEAVES OF COMMON WOODRUFF, ARRANGED IN A WHORL.

equally delight and puzzle the young botanist, such as the Monkey Orchis, *Orchis macra*; the Pyramidal Orchis, *O. pyramidalis*; the Bee Orchis, *Ophrys apifera*, an extremely handsome imitative flower; and the Spotted Palmate Orchis, *Orchis maculata*, the best known of all, and not the least beautiful.

As we have near upon forty native species of Orchids, the beginner in field botany must not expect to make acquaintance with the whole of them without exercising much patience and perseverance. They haunt copses, hedgerows, chalky downs, quarries, and railway cuttings. A few of them are beautiful, many of them are curious, all are interesting, and indeed there is not in these islands a tribe of plants more worthy of attentive study, both for their intrinsic merits as constituents of the British Flora, and their relations to the more gorgeous Orchids of the tropics which we cultivate with so much care in our hothouses.

If we were attracted to the copse by the Orchids, we might not deem it waste of time to gather a tuft of Woodruff, *Asperula odorata*, both for its elegant clusters of white flowers, and the delightful odour it will impart to linen, books, etc., if placed amongst them while fresh and there left to wither. Its whorled leaves afford a sufficient character for readily determining it, independent of its neat little compact, wax-like, white flowers.

The Orchids constitute a large group of plants, notably in popular estimation for the various resemblances of their flowers to insects, birds, and even larger animals. Ours are the very humblest of the family, but from them we may learn useful lessons to aid us in the investigation of the whole race, or, at the very least, to enhance our enjoyment of the lovely Dendrobies, Oncids, and Cattleyas of the garden. Every orchid flower consists hypothetically of fifteen parts, namely, three sepals, three petals, three stamens, three pistils, and



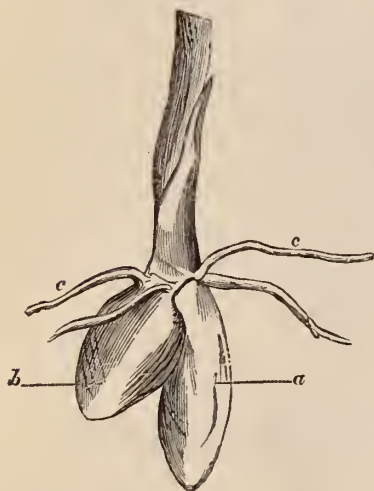
COMMON PURPLE OR MEADOW ORCHIS.

- 1 1, pieces of the perianth, comprising both sepals and petals;
2, pollen pouches; 3, stigma; 4, spur; 5, twisted ovary supporting blossom; 6, bract; 7, waxy pollen masses.

three carpels. But the several genera exhibit every imaginable variation of the hypothetical characters. Thus, the labellum, or lip, which is in many instances the largest, most highly-coloured, and most prominent feature, is but one of the petals curiously modified. The three sepals are usually equal in size and shape, and therefore easily determinable. Instead of three stamens there is commonly only one produced, and this is usually combined with one or more pistils, forming what is called the column. In the noblest of the British Orchids, the Ladies' Slipper, *Cypripedium calceolus*, two stamens are fully developed, and the third occurs in a sterile condition between them forming the column.

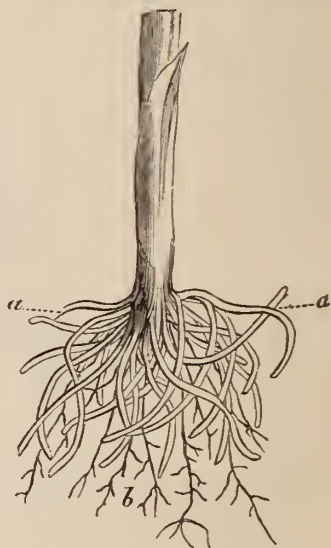
One of the commonest Orchids in flower now is the Common Purple or Meadow Orchis, *O. mascula*, which has a succulent stem

tinged with purple, glossy green leaves spotted with purple, and showy spikes of pale lilac, or rich reddish purple flowers, the lip spotted with white. They emit during the day a pleasing perfume, but at night are too strongly scented to be agreeable. Each flower rises from a twisted ovary which serves the purpose of a peduncle, and has a long spur turning upwards. The roots of this plant are as interesting as the flowers. The plant springs from a tuber, which, being rich in starch, and the source of a highly nutritious substance called "salep," or "salop," we may regard as a miniature potato. In common with most other tubers, that from which the plant of the seasons is produced, perishes as the plant attains maturity, but is succeeded by another which grows on one side of it, and attains its full size long before the exhausted tuber disappears. One of the consequences of this mode of reproduction is, that the plant of this season is about half an inch distant from the spot whereon its parent



ROOT OF EARLY PURPLE ORCHIS.

a, exhausted tuber; *b*, fresh tuber;
c, fibres of roots.



ROOT OF BIRD'S-NEST ORCHIS.

a, fibre-like tubers; *b*, fibres or
rootlets.

of the previous season grew, and this, therefore, is a travelling plant. The Dwarf Dark-winged Orchis, *O. ustulata*, is common now on chalky pastures, and especially in the neighbourhood of Dover and Folkestone. It is a tiny thing, with deep green leaves, and a spike of flower-buds that looks as if burnt; but when the flowers expand, their large white lips may be likened to laughing faces peeping out from dark hoods. The Common Tway blade, *Listera ovata*, has no beauty, but it is well worth looking for in copses and on the shady borders of pastures. It has two broad glossy green leaves, three to four inches long, placed half-way up the stem, and

a number of insignificant yellowish-green flowers. A more remarkable species is the Bird's-nest Orchid, *Listera nidus-avis*, which has a weird aspect, and once seen will never be forgotten. The flowers and the flower-stem are of a dingy brown hue—a flower for witches much more than fairies. The root repeats in a more complex form the character of the Meadow orchis, consisting of tubers which produce young plants in the following season.

The Military Orchis, *O. militaris*, is an inhabitant of chalky hills, and common in the midland counties, wherever such hills occur. It closely resembles the Monkey Orchis, but has more colour, the helmet being of a pale ash colour, the tip rosy purple, with spots.

Everywhere now we see upon shady banks the lovely white flowers of the great Stitch-wort, *Stellaria holostea*, which may be called a large and grand edition of the common chickweed, with a capacity for climbing, for it towers up amongst robuster plants by the aid of its rough leaves and stems. At the slightest touch the



COMMON KNOT-GRASS MAGNIFIED.

A, side view; a, perianth; b, membranous bracts. B, front view; a, triple styles. C, style much magnified.

stem snaps asunder; hence it is often called by country people, "All-bones;" it also bears the name of "Cuckoo-flower;" indeed, we have several so-called Cuckoo-flowers—a sufficient answer to such as protest that vulgar names are enough, and Latin names more bother than they are worth. Mixed with it, perhaps, may be the glorious flowers of the Garlic Treacle Mustard, *Sisymbrium alliaria*, a coarse plant, with large, light-green, heart-shaped leaves acutely toothed, and terminal heads of small, white, cruciferous flowers. If any doubt about the plant when you find it, taste a bit; you will find it pungent, and the odour of garlic is unmistakeable if the plant is brushed over with the hand.

In the field paths, the Knot-grass, *Polygonum aviculare*, is now showing a few of its pretty pink flowers, a member of the Persicaria order; a troublesome plant to the farmer, but making some amends by its nutritious qualities and the partiality of sheep for it. On old walls and on rocks may be found the Yellow Fumitory, or Common Corydalis, *Corydalis lutea*, which is also a favourite on the

garden rockery, and one of the best known of garden plants. The Woodsorrel, *Oxalis acetosella*, haunts shady places, where it may be quickly found by its beautiful tufts of delicate thrice-divided leaves, like spiritual clover leaves, and delicate white flowers, which are marked with fine pencil-like lines. Lastly, to complete the May garland, bear in mind to hunt the woods well for the Herb Paris,



HERB PARIS.

Paris quadrifolia, a most elegant and peculiar plant, allied to the Smilax, which you may as easily determine when you find it by the aid of the subjoined figure, as by the most elaborate description.

“The honeysuckle round the porch has woven its wavy bowers,
And by the meadow-trenches blow the faint sweet cuckoo-flowers,
And the wild marsh-marigold shines like fire in the swamps and hollows grey;
And I’m to be Queen o’ the May, mother, I’m to be Queen o’ the May.”

TENNISON.

SOLLYA.



TWO varieties of this genus—viz., *heterophylla* and *linearis*—although not deserving to be classed amongst the most showy inmates of our plant-houses, are nevertheless worthy of a place in even limited collections. They are exceedingly easy to manage, soon form large specimens, and produce their pretty blue flowers long and profusely during the summer months, when a variety of specimens of hard-wooded plants is much wanted. Cuttings of short-jointed bits of the young wood in a half-ripe state, if planted in light

peaty, very sandy soil, and placed in a gentle bottom-heat, will be found to root freely; and both varieties seed freely.

Cuttings are generally preferred; but, whether obtained from seeds or cuttings, the young plants should be potted singly in small pots, as soon as they are sufficiently strong to bear handling, placing them in a rather warm, close, moist situation, till they get established. It is always advisable to endeavour to have such things rooted early in the season, in order to allow of getting them strong and well established before winter. A cold frame will form the best situation for the growth of the young plants during summer, to which they should be removed as soon as the weather will permit; for there is nothing gained by keeping these plants in heat.

The frame should be kept rather close and moist, and slightly shaded on the forenoons of bright warm days. Frequent stoppings will be necessary during the first season's growth, in order to get the plants well furnished at the base, and they must also be afforded plenty of pot-room, and carefully supplied with water. In case of persons not having had much experience in the management of such things, it will, however, be advisable to avoid re-potting later in the season than will allow of getting the pots moderately filled with roots before winter; for it requires some experience to properly supply recently-potted plants with water. After about the middle of September, the atmosphere should be kept moist, and a free circulation of air afforded on fine days, in order to ripen the wood before the approach of winter; and the plants should be removed to their winter quarters before they are injured by the effects of damp or frosty weather. During that season they should be afforded a temperature of 35° to 40° , giving water carefully, and they should occupy a light, airy position. If large specimens are wanted without loss of time, growth should be induced early in spring, by removing the plants to a moist temperature of about 45° , allowing it to rise 10° or 15° higher with sunshine and air, and affording them all the light possible. Examine the state of the roots, and if more pot-room is necessary give a liberal shift, and keep rather close and moist until the roots lay hold of the fresh soil; and, as soon as this is observed to be the case, cut the shoots back, removing any indications of bloom, and train them so as to induce the lower buds to start into growth. If all goes on well vigorous growth will soon commence; and if green-fly makes its appearance, apply tobacco-smoke.

Until the plants can be shifted into their flowering-pots, and a proper trellis used, the shoots should be trained to stakes. In May remove the specimens to a cold frame, and treat them during the season as recommended for last, only that air may be given more freely, and, on mild settled nights, the lights may be left off altogether, so as to give the plants the benefit of the night dews. With ordinary management, good-sized specimens, in nine-inch pots, will be obtained by the end of the season, and these may be allowed to bloom the following summer, or cut back sufficiently to remove the flower, and re-pot in good-sized pots—say thirteen-inch—which

May.

will be sufficiently large to produce fine bushes. Water must be applied very cautiously after giving a large shift, and the atmosphere kept rather close and moist, to induce the roots to strike the fresh soil. Apply the trellis on which the plants are to bloom directly after potting, and train the shoots to it, taking care to get the lower part well furnished first. Keep the plants clear of insects, and properly supplied with water, and afford them a cool airy position as soon as they have got hold of the fresh soil, and they will make very rapid progress; and, by giving a small shift about every other year, they will bloom finely in the greenhouse or conservatory for many summers. For soil, use rich turfy peat, carefully broken up into small pieces, and well intermixed with about one-fourth its bulk with sharp silver sand. The addition of a small portion of sandy turfy loam will be advisable in the case of having to use poor sandy peat.

ERANTHEMUM PULCHELLUM.



WHEN properly managed, this is an extremely useful plant, forming, as it does, large compact specimens in a short time, and producing bright blue flowers for many weeks in succession, during the winter months. It, however, requires the temperature of an intermediate house to have it in perfection; for, unless it is afforded a heat of some 50°, the flowers are never sufficiently numerous at one time to render it effective. Cuttings made of young wood in a rather firm state, planted in sandy soil, and placed in a gentle heat, strike root readily. When sufficiently rooted, pot them off singly in small pots, placing them in a pit or frame, where a warm, moist, shady atmosphere is maintained, until they have become well established.

Like all plants from a warm climate, this delights in a gentle bottom heat; and if that can be afforded to young plants, they will grow with astonishing vigour, forming fine broad healthy foliage, which no insect will venture to attack. They should, however, be placed near the glass, and afforded a moderate circulation of air on fine days, with all the light possible, except on the forenoons of very hot days, when a light shade for a few hours will be beneficial. Attend to shifting as the pots become filled with roots, giving liberal shifts; and unless side shoots are formed near the base of the plant, pinch out its top; but the habit is such that this will seldom be necessary. It will be expedient, however, where the object is to grow large specimens quickly, to keep the shoots well tied out until a good foundation is secured; and even afterwards, the use of a few sticks to regulate the main branches, so as to admit light and air among the foliage, and preserve the plants in form, will be useful. Syringe liberally on the mornings and afternoons of bright days, and be careful to keep the plants thoroughly moist at the roots, giving manure-water in a clear, rather weak state, frequently. Plants intended for blooming, should be so managed as to have their

growth completed by the end of September, and should be kept dry at the root, and cool for a month, which will effectually check all tendency to the formation of wood, and prepare the specimens for blooming. After allowing a short period of rest, give them a liberal supply of water at the root, placing them in a temperature of 50° or 55°, when flowers will soon be produced in abundance. Under the most favourable circumstances, the individual blossoms are not of long duration, and care should be exercised to prevent them being injured by damp, and to remove them as soon as they fade, otherwise the decayed flowers will greatly detract from the beauty of the finest specimen. After blooming, cut back the shoots severely, leaving only sufficient wood to form a good foundation, and place the plants in any spare corner of a pit, or wherever they will be safe from frost, and give no more water to the soil than will suffice to prevent its becoming very dry.

In the case of old plants, from which only a moderate growth is expected, it will be unnecessary to start them into growth until towards June; but young plants may be started after allowing them about a month's rest. Old plants should be turned out of their pots, reducing ball, so as to be able to re-pot in fresh stuff in the same sized pots, placing them in a nice, moist, warm temperature, to induce free growth, but avoid over-watering at the root at this stage. If thrips make their appearance upon the plants, and they are somewhat liable to this pest during the early stage of their growth, apply tobacco smoke, in moderate doses, on two successive evenings, which will entirely destroy the thrips. Good mellow turfy loam, mixed with a little well-decayed cow dung, or leaf soil, and a portion of clean sharp sand to keep it porous, will be found more suitable for the growth of this plant than a lighter compost.

CYTISUS CANARIENSIS.



THIS beautiful and free-flowering shrub is exceedingly well adapted for conservatory display during the spring months, inasmuch as it presents an admirable contrast to the delicate colours of the Chinese Azaleas, and the more gorgeous masses of Indian, and hybrid Rhododendrons which ought to abound in all such structures in the earlier part of the season. It is also an excellent subject for bouquets, the bright yellow colour of its spikes yielding sprightliness and variety when used in conjunction with Camellias, Roses, Primulas, Cinerarias, and such like; whilst Violets, Sweet Briar, Balm of Gilead, and sprigs of Myrtle, furnish the requisite sweetness. It is grown here in bottomless pots, plunged to the rim in the conservatory bed. By this means it is kept within moderate bounds, and flowers more freely when grown in the open soil. This system also insures a positive degree of health which large pot-bound specimens seldom present for any lengthened period; the plants are moreover readily

May.

removed when rearrangement is required, and this, when occasionally repeated, gives an air of freshness to the whole house, for one tires of seeing the same plant continually under the same circumstances and associations. There is a large plant growing here in an inverted seakale pot, and plunged to the rim in the conservatory border, which measures twelve feet in height, and seven feet through, and is at this moment, and has been for these last two months, profusely covered with its spikes of brilliant yellow blossoms; and there are many others, plants of not more than from two to three feet in height, which blend their flowers with those of cinerarias, hyacinths, and such like, down to the floor of the house.

It is rather subject to the attacks of red spider, and requires, in consequence, a somewhat free use of the syringe when out of flower, and an occasional drenching with soapsuds, which here are a never failing remedy against the attacks of these troublesome insects; care is however taken to ascertain that this material is not too dirty, or overcharged with potash or other deleterious ingredient, or the plants would have a dirty appearance for some considerable time.

REMINDERS FOR GARDEN WORK IN MAY.



PINKS should have all the stems but one removed, and all the buds but two or three at the most taken from that single stem that is left. Top dress the beds with rotten cow-dung, stir the earth first between them, and water if the weather prove dry.

PLANTS kept in the dwelling-house or in pits may be planted out in the ground by the middle of the month; fuchsias, geraniums, verbenas, petunias, and other clump and border plants.

DAHLIAS may be planted out by the 15th, both those from cuttings and those from parting the roots, also old roots that have not been parted or propagated. Dahlias in plantation by themselves should be six feet apart every way, and have their stakes driven down before they are planted, that they may be tied up at once to protect them from wind. Lay all sorts of traps for earwigs directly, and hunt them industriously.

CUTTINGS of all kinds may be taken from biennials, perennials, and most plants, and struck under a hand-glass.

PANSIES must be top dressed, and the litter taken away; water must be dispensed liberally in hot weather, and the hottest sun kept off; cuttings may be struck in the shade under a glass, side shoots are best for this.

AURICULAS, as they decline their bloom, should be placed on a hard ground where they may have all the wet and air; and if the seed be not wanted, pick off the vessels, but do not cut down the stem.

ANNUALS that have been raised in heat may be planted out in beds or borders, when they are to flower or be potted off, particularly balsams and cockscombs for blooming in pots.

WALL FRUIT TREES must be looked over, and their useless shoots removed, all those that grow out straight from the wall and those which are in each other's way. The shoots which are retained should be trained in a right direction; and when any shoot is too vigorous for the rest of the tree, it is better to cut it away. Thin the fruit as soon as it is large enough.

STANDARD FRUIT TREES should be as well attended to as wall fruit trees, but, as they are not quite so easily got at, they are mostly neglected, otherwise there is no one operation that benefits the wall tree that would not also benefit the standard, whose fruit would be very nearly as large and better flavoured.

SPRINGING FRUIT TREES.—This is of the greatest service, not only in dislodging vermin of all kinds, but cleaning and refreshing the trees.

VINES should be looked over, and the shoots stopped at the first or second joint beyond the fruit; clear them of all useless shoots; and see that the others are nailed properly.

STRAWBERRIES IN FLOWER will require watering if the weather be at all dry.

BROAD BEANS.—Sow more if it be desirable to have successive crops, though few care to have a continuance. Take the tops off them in flower, and draw the earth up round the earlier sown ones.

SAVOY SEED.—Sow for a late crop, plant out some of the earliest sowing.

PEAS.—Sow some twice in the month; peas should be sown right through the season, every fortnight or three weeks; earth up those which are up and advancing; stick those which are forward enough.

ENDIVE should be sown for a few early plants in rich open ground.

POT HERBS may be sown, and slips may be put in the ground.

RADISH SEED.—Sow more, and choose some of the handsomest of the crop gone by to plant for seed, and choose those which are most smooth-skinned and bright-coloured; plant them in a row two feet apart.

CELEERY.—The March-sown will be large enough to prick out; take the largest, and contrive to thin the seed-bed all over, rather than clear it in any part; prick them out three or four inches apart, on a piece of rich ground, there to strengthen six weeks; water them in to settle their roots.

ONIONS must be hoed and cleaned, the plants for bulbing must not be closer than four or five inches; if, however, any be left, they may be drawn for salads; but it is better not to have the bed trampled upon oftener than is necessary, therefore it should be well cleared of weeds and properly thinned at once; support the stems of those going to seed.

CABBAGES.—Transplant a quantity of the spring-sown ones in rows eighteen inches apart every way. Tie up some of those that are forward enough, so that the hearts may be whitened; earth up them that are advancing, loosening the soil, drawing the earth up the stems. Sow other seed.

CAULIFLOWERS, protected with handglasses, are now beginning to show flower, and when this is the case break down one or two leaves to cover them from the wet and sun. If the weather prove very dry, the plants must be watered; transplant others from the seed or nursery bed, and sow more seed.

BROCOLI SEED must be sown this month; and it is better to sow two or three kinds, and at two separate seasons, a fortnight apart.

KALE or BROWN COLE, or BORECOLE, sow this month, if it be intended to grow any, for it is a coarse vegetable.

KIDNEY BEANS may be planted for a principal crop, and scarlet runners. The former in drills three inches to four apart in the drills, and the drills eighteen inches; the latter six inches apart in the drills, and three feet apart.

CAPSICUM and TOMATO PLANTS.—Put a few under a south wall, or at the foot of a south bank.

LETTUCE.—Transplant some of the strongest lettuce plants, thinning the place they were sown in, that the roots may perfect their growth on the seed-bed. Sow some of the different varieties.

CUCUMBERS.—Level the soil in the bed, and lay the branches out of each other's way; pinch off the ends of vigorous shoots.

SMALL SALAD.—Sow mustard, rape, cress, radish, and other small salad herbs.

SPINACH.—The sowing of this must depend entirely on the supply required; if it be required in any quantity, it must be sown once a fortnight, as it should be pulled and eaten before it runs up to seed. It may be either sown evenly all over a piece of ground allotted to it, or in drills a foot apart from drill to drill.

May.

TURNIPS.—Sow turnips, and hoe and thin out to eight inches apart those which are forward enough.

CARROTS and PARSNIPS must be also thinned out as soon as they are large enough, and must not be left nearer than eight inches apart ; and carrot seed may still be sown.

TO CORRESPONDENTS.

MONSTERA DELICIOSA.—*R. B., Carmarthen.*—This stove plant should be easy of cultivation, and should succeed in a mixture of peat and loam, and may be propagated by dividing the roots.

WILD FLOWERS.—*T. S., Bolton.*—You will find your request answered by an article in the present number, which may be followed by others on the same subject.

BOOK ON FERNS.—*Mrs. B., Donnybrook.*—We have handed your letter to our publishers, who will answer it.

LILY OF THE VALLEY.—*M. C. K., Dungannon.*—You do not say how long your roots have been planted ; as a rule, this plant will not flower well until it is thoroughly established and is impatient of removal. Perhaps the article on the subject in the present number will assist you in determining the cause of your non-success.

SNOWDROP.—*J. H., Ballingany.*—We do not recognize your snowdrop as a distinct variety.

AZALEAS.—*Alpha.*—These may now be struck from cuttings of the less than half-ripened wood, or as soon as the young shoots are about $1\frac{1}{2}$ inches in length, if you are skilful in the art of striking.

RED SPIDER.—*C. H. D., Devon.*—This pest may be destroyed by means of sulphur ; the best way of applying it is to heat your flues or hot-water pipes, and then while they are quite hot to wash them with lime and flower of sulphur.

FUCHSIAS.—*Oxford.*—If you destroy the blossom buds now, they will flower stronger and better in the autumn ; but we should not recommend you to do this unless the branches are weak and drawn, as the fuchsia is not a plant that suffers much, if at all, from blooming.

PEACHES and NECTARINES.—*W. B. Y.*—When the fruit of these drop at the time of stoning, the trees are probably weak from overbearing, bad pruning, or the effects of insects, or the evil may arise from the injury caused to the embryo by frost.

B. D., Salisbury.—We are sorry that we cannot assist you in the cultivation of your plant, as we do not recognize it.



Epipactis atrorubens



Epipactis atrorubens



Epipactis atrorubens



Epipactis atrorubens

SUMMER WILD FLOWERS.



As the summer advances the flowers change their places, like the stars in heaven. From the fields and the copses they seem to be travelling to the mountains, to the great lakes, to the rocky wildernesses, and the lands deserted by all save them. There are flowers in the meadow now whether the grass be rising fat and flowery for the scythe, or be already closely shorn, and the fragrant harvest lying in heaps around, while a new green blade is springing, and needs but one shower to bring forth again upon the even mead the delicate greenness of the spring. Flowers, indeed, are plentiful everywhere, but a host of elegant things that lighted up the hedgerow and the meadow have departed, but the heath lands and the rocks are sweetly dotted with the fresh growth of ferns, and the waters are newly fringed with their own peculiar forms of vegetation.

Glancing again at the hedgerows and gardens, we shall find many flowers yet in their prime that belong rather to May than June. Prominent amongst these are several of the Borage tribe, renowned for the fine tones of azure and amethyst in their flowers, and the presence in sensible quantities of nitrous salts in their juices. One well worth searching for, and as likely to be found in the cottage garden as the field, is the Lungwort, *Pulmonaria officinalis*, with spotted leaves, lively pink buds, and bright blue flowers. A near relation to it is the Common Gromwell, *Lithospermum officinale*, which haunts rubbish heaps and dry banks. It grows a foot or more high, and has rough leaves and dirty yellow flowers, which are succeeded by nut-like seeds of a grey colour, which deck the plant like so many pearls. The Common Borage, *Borago officinalis*, with its splendid blue flowers, may be regarded as the type of its race; and the student of botany would do well to grow it in the garden, for indeed it is rarely met with wild. It will be found that the flower of this plant consists of a single petal cleft into five divisions forming a proper corolla, with five stamens inserted into the corolla, and alternate with its lobes. On the under side is a calyx of five divisions. The corolla falls in one piece, leaving the calyx complete to protect the seeds. The Viper's Bugloss, *Echium vulgare*, is a robust and rough relative of the Borage, and one of the most splendid of all our wild flowers. It attains a height of two or three feet, the flower spike often measuring a foot in length. The flowers occur in a succession of short comb-like tufts, the buds bright pink, the flowers pale blue, or full cobalt blue, or richest violet—a glorious assemblage of colours that compels us to pardon the rusticity of the plant.

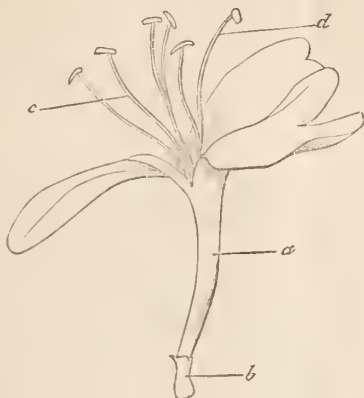
Less interesting, perhaps, but more useful than any other member of the Borage tribe, is the Comfrey, *Symphytum officinale*, which may be known by its large light-green leaves, numerous bristles, and clusters of white, yellow, or pink flowers, which remotely resemble in form those of Solomon's Seal, though the Comfrey is very far removed from that plant, which, indeed, belongs to the lilies. The Comfrey affords excellent food for milch kine, and is in

many parts of Ireland cultivated for that purpose. The moist places the Comfrey inhabits are the homes of two of the Forget-me-nots, which are also alliances of the Borage. The true Forget-me-not is the Water Scorpion Grass, *Myosotis palustris*, a robust leafy plant which fringes the sluggish river, and frequently chokes up the smaller streams, for which it abundantly compensates by the beauty and plentifulness of its pale blue flowers, which are as like turquoises as any flowers can be. There are a few other species of myosotis natives of Britain, not all of them water plants, for some inhabit mountainous regions, and others haunt the woods and the fields. The Creeping Scorpion Grass, *M. repens*, though ranked as a species, is only a poor variety of the last, met with in sour bogs. The Tufted Scorpion Grass, *M. cæspitosa*, is not tufted, but crowded in its growth. It very closely resembles in leaves and flowers *M. repens*, and, indeed, is but a variety of *M. palustris*. The Upright Wood Scorpion Grass, *M. sylvatica*, is distinct and beautiful, most beautiful, with oblong leaves and large handsome blue flowers. It is scarce, but may be looked for in dry shady places. The Rock Scorpion Grass, *M. alpestris*, is an Alpine form of the last, with smaller flowers. The early Field Scorpion Grass, *M. collina*, is a tiny thing, growing on walls and roofs. It has one distinguishing quality, that the flower buds are never pink as in other kinds. The Common Field Scorpion Grass, *M. arvensis* resembles *sylvatica*, especially when growing in the shade, but is never quite its equal in beauty. The Yellow and Blue Scorpion Grass, *M. versicolor*, is the most distinct of all, for the simple reason that its flowers vary from bright yellow to bright pink and bright blue. It is a sweet little thing, by no means rare, and to be looked for in dry as well as in moist places. The Alkanets and the Bugloss, which also belong to the Borage family, may be better studied in the garden than in the field, and it will be a poor garden that does not contain some of them.

Having returned to water scenes we may expect to find the Buckbean, *Menyanthes trifoliata*, a splendid aquatic, with noble bright green leaves and elegant pink flowers, which are charmingly fringed. As for the Lilies, we have but three, one of which is doubtful. The Great White Water Lily is *Nymphæa alba* of the botanists; the Yellow Water Lily is *Nuphar lutea*. If anywhere in our watery wanderings we should light upon a bog, we might find the two-flowered Linnæa, *Linnæa borealis*, which Linnæus adopted as a crest for his coat of arms, and which, in his own fanciful way and in remembrance of his early struggles, he considered as especially an emblem of himself, "a little northern plant, flowering early, depressed, abject, and long overlooked."

It would be strange if in a June ramble we did not somewhere meet with the Honeysuckle, and it would be fortunate to find the two-flowered Linnæa on the same day, for they both belong to the same natural order, and Woodbine tribe. In this order are grouped the Elder and Guelde Rose, in addition to the Linnæa and the Honeysuckle, plants that differ immensely in their habits and attractions. In all of them the corolla is in one piece (monopeta-

lous), but deeply cleft as if formed of four or five separate petals; the calyx is attached to the ovary. The fruit is usually a berry, bearing the calyx on its summit, and the leaves are always opposite. Three species of Honeysuckle grow wild in Britain. The Common Woodbine or Honeysuckle of the woods, *Lonicera periclymenum*, is



MONOPETALOUS FLOWER OF COMMON HONEYSUCKLE.

a, corolla; b. calyx; c, stamens; d, pistil.

too well known to need description. It is one of the first trees to unfold its leaves, and it wreathes the dark holly and the grey branches of the elm all the summer long with its elegant wreaths of flowers. It is the "woodbine" of Shakespeare, and with him the companion of the wild rose.

" I know a bank whercon the wild thyme grows,
Where oxlips and the nodding violet blows,
Quite overcanopied with luscious woodbine,
With sweet musk roses and with eglantine."

Chaucer refers to the same plants under the names woobine and eglantine; but Milton uses "twisted eglantine" for the sweet brier rose. The dull red berries of the plant have a very poisonous look late in the summer, when they become numerous; they are, however, equally harmless and useless. The Perfoliate Honeysuckle, *L. cuprifolium*, is equally beautiful, but the flowers are paler in colour and the berries are of a bright orange colour. When met with, this may be distinguished by the twofold leaf, or, as the botanist would say, connate leaves immediately beneath the flowers. This belongs to the woods of the east coast, suggesting the probability of its having been introduced from Northern Europe. The Fly Honeysuckle, *L. xylosteum*, is still more scarce. It has egg-

shaped downy leaves and very small pale yellow flowers, which are quite destitute of fragrance.

Amongst the more showy plants of the month due mention must be made of the White Campion, *Lychnis dioica* or *L. vespertina*, which, though usually white, yet varies in colour considerably. It is not only conspicuous by its bold habit and beauty, but is an extremely interesting plant, because hypothetically as a member of the Carnation family, the flowers should always contain both stamens and pistils; whereas we usually find the stamens in one flower and the pistils in another. In the language of botany the plant is diœcious. Occasionally, however, both stamens and pistils occur in the same flower.

The *Lychnis* may be allowed to introduce us to the Carnation family at large, and it is quite time to hunt for Wild Pinks, Catchflies, Corn-cockles, Pearlworts, Sandworts, and Stitchworts, though many of them will be bright with flowers until September. The Carnations and Pinks the florists cultivate are, generally speaking, double flowers, which the botanists have the temerity to call "monsters," in return for which compliment to their favourites the florists pretend that all the beautiful flowers belong to themselves and the ugly ones to the botanists. Well, the Wild Clove, *Dianthus caryophyllus*, belongs to the botanists, certainly, and they need not be ashamed of it on the score of beauty; the florists, with all their grand possessions, cannot beat it. It is the Clove Gilliflower, or July flower of the old gardeners, and doubtless is the parent of the Carnation and Picotees of the garden. It is probably not a true native, but has found its way here from the continent, the southern slopes of the Alps being, without doubt, its original home. Here it is almost confined to the south-eastern parts of England, where it seeks out for itself the grim castles and crumbling walls of the oldest cities, the keep of Rochester Castle having long been famous amongst English botanists for this glorious wilding and its boon companion the Snapdragon. The Cheddar or Mountain Pink, *D. cæsius*, is a rare gem met with on the cliffs at Cheddar, in Somerset, one of the best possible resorts for a botanical tourist. It is a sweet little gem of a cheerful pink colour. The Soapwort, *Saponaria officinalis*; the Corn-cockle, *Agrostemma githago*; and the stemless Catchfly, *Silene acaulis*, may be found in the garden, perhaps, if not in the field. But we shall scarcely find, under the care of the cultivator, that somewhat coarse but handsome plant, the Bladder Campion, *Silene inflata*, which the children might have been seen eating the leaves of a month ago, when they tasted like green peas. This may be known by its pouch-like calyx. The Ragged Robin, or Cuckoo-flower, *Lychnis flos cuculi*, you are so likely to know without help from books, that it is mentioned here only because its beauty forbids silence.

But let us look for humbler relations of the Carnation than these. The Great Stitchwort, or Satin flower, *Stellaria holostea*, has been already referred to as one of the gems of the hedgerow. On the dry pastures and heaths we may find its poor relation, the little Stitchwort, *S. graminea*, which has very narrow leaves, and pretty white

satin flowers. In the bog is another, the Bog Stitchwort, *S. uliginosa*, with broad leaves and tiny insignificant flowers. The Sandworts are a numerous and puzzling family, but one of their number may be found almost anywhere on the sea coast, for it loves the rock, the drifted sand, and the salt marsh alike, but it nowhere thrives except near the sea. This is the sea-side Sandwort, or sea-side Alsine, *Arenaria marina*, or *Spergularia marina*. The stems are prostrate, the leaves semi-cylindrical, with accompanying white chaffy stipules, the flowers lilac and purple. You may pass over carpets of this pretty plant in rambling amongst the rocks, and yet know nothing of its beauty, for the flowers close soon after noon on dull days and are never open after four p.m. The Purple Alsine, *Arenaria rubra*, is a good imitation of the sea-side Alsine, but a smaller and less succulent plant, not at all in love with the sea, for it grows on sand and gravel almost everywhere. They are probably two forms of the same species. Closely allied to the *Arenarias* and *Stellarias* are the Mouse-ear Chickweeds, the handsomest of which is the Field Chickweed, *Cerastium arvense*, a plentiful plant in a few districts, usually found on sandy banks in the full sun. It is so like the Great Stitchwort, that it may be easily mistaken for it, but on comparison, will be found to differ in many particulars, not the least important being the darker colour of its leaves, those of the Great Stitchwort being of a most delicate light green. The pretty silvery-leaved plant employed for edging flower-beds, *Cerastium tomentosum*, the "serastum" of the rustic who has picked up a few garden names, is the prettiest of all the family, and a good type of them too when allowed to become half wild and produce, in spring, its exquisitely finished white satin flowers. It is a native of Southern Europe.

More humble than all these, but equally worthy of notice, are those little tufty moss-like plants, the Spurreys, of which we shall select four for special notice. For the first go and search at the foot of an old brick wall, or on a damp cinder-heap, or amongst a lot of plants in flower-pots, for a mossy tuft of bluish-green vegetation, dotted with tiny grey flowers. It is the Procumbent Pearlwort, *Sagina procumbens*, an Alpine plant, which condescends to make itself at home anywhere, and usually prefers to clothe with its glossy green mossy cushions spots where no other plant could grow. In warm spots on sand and brick it usually remains green all the winter, but is best worth finding while in flower.

A plant very closely resembling it, but quite distinct and far more beautiful, is the Pearlwort Spurrey, *Spergula saginoides*, which occurs in plenty on the Scottish highlands, and might be sought with some hope of success on Dartmoor, and even on the Bagshot Sand. But failing all means of obtaining wild specimens, you may secure tame ones by cultivating the so-called *Spergula piliifera* of gardens, which is merely a large flowering variety of the Pearlwort Spurrey, introduced to English gardens in 1859 as a substitute for grass on lawns. It never acquired any solid popularity, and yet it really does form, when properly managed, the most beautiful lawn imaginable; bright as the best grass newly mown,

and soft to the foot as the most luxuriant growth of moss. This plant is of finer texture than the last, the leaves are narrower, and have a more delicate bristle-like point, and instead of tiny grey flowers, it produces comparatively large flowers of the purest white. A large patch of it in full bloom is as pretty a sight as one need wish to see in a day's march. You will have no difficulty, after having studied Chickweeds, and Sandworts, and Stitchworts, in determining that these two plants belong to the Carnation tribe, and hence the natural system recognizes them as near relations. Yet, because of a little disagreement in their constitutional arithmetic, they are separated by the Linnæan system by six classes, so that to



PROCUMBENS PEARLWORT.

cite only one example of results, if we refer to Deakin's "Florigraphia Britannica" for descriptions of them, we find the sagina in the middle of the first volume, and the spargula in the middle of the second. The first belongs to Class IV., Order III., having four stamens and four pistils. The second belongs to Class X., Order IV., having ten stamens and five pistils.

There are three other species of Spurrey, and two other species of Pearlwort. The Corn Spurrey, *S. arvensis*, is known in Norfolk as the "Pick-purse," being regarded as an injurious weed, whereas, in truth, it is highly nutritive, and in Holland and Germany is frequently sown with corn in order that there may be plenty of it on the land the following season, when the cattle are turned out on the stubble. The Knotted Spurrey, *S. nodosa*, grows in marshy soils, preferring sandy spots. It is of a wiry, straggling habit, and produces large white flowers.

A host of plants will have come under observation while the foregoing studies were in progress. Several of the Yarrows may have been found in flower, the most common being the Common Milfoil, *Achillea millefolium*, a valuable pasture plant, and by no means valueless in the garden, for it answers well for turfing hot sandy banks where grass is sure to be soon burnt up in summer. The "Rosy Yarrow" of the garden border is a variety of the same plant, and one so rare in its beauty, though commonest of the common, that its flowers may be as fairly likened to jewellery, as any other flowers that have been so honoured. The Wild Yarrow is usually white, but it is by no means uncommon to meet with many shades of flesh and pale pink where the plant grows in plenty.

Another pretty kind is the Woolly Yellow Milfoil, *A. tomentosa*, a pretty little Alpine species, with downy leaves and fine tufts of golden yellow flowers. The favourite British Yarrow of the garden—if the Rosy Yarrow does not happen to be the favourite—is the Sneezewort Yarrow, *A. ptarmica*, with snowy white flowers, and extremely elegant leaves, which grow in a tuft close to the ground, and being finely cut, and of a pleasing tint of green, often cause the plant to be mistaken, when not in flower, for a fern, which it fairly resembles. The double-flowering variety belongs especially to the garden. It thrives best in a moist, shady spot, but will grow almost anywhere. The Yarrows belong to the composite order, and have the bitter, pungent, and peculiar odour by which their near relatives the camomiles and feverfews are distinguished.

Many Geraniums or Crane's-bills, in addition to the Herb Robert already noticed, will attract our attention during the sunny month of June. A splendid Alpine species, the Bloody Crane's-bill, *Ger-*



PEARLWORT SPURNEY.

(The detached flowers are natural size.)

anum sanguineum, has many orbicular or kidney-shaped leaves, and a few large solitary flowers of a fine purplish crimson colour. This you will find in every garden where good hardy plants have the encouragement they deserve. The Dusky Crane's-bill, *G. phæum*, is a strong-growing plant, with flowers of a deep, dingy, purplish-black colour. It may be found wild in mountainous woods, and in the garden where such plants are prized. The Wood Crane's-bill, *G. sylvaticum*, grows two to three feet high, with large deeply-lobed leaves and flowers growing in pairs, in large clusters at the summit of the plant; they are of a fine light purple colour, pencilled with dark lines. This may be distinguished from all other British Geraniums by the hairs on the stems of the stamens, or, in other words, by its ciliated filaments. The Blue Meadow Crane's-bill, *G. pratense*, grows in moist rich pastures in mountainous districts; the leaves are deeply cut, the flowers grow in pairs; they are of a fine blue colour. There is no wild plant to surpass this in beauty

June.

when it attains its highest development, but it must have shade and a rich soil to show forth its full beauty. The Dove's-foot Crane's-bill, *G. molle*, may be known by the roundish leaves which grow next the root, and deeply-notched petals of a pinkish-purple colour, though in many of its characters it resembles the Small-flowered Crane's-bill, *G. pusillum*, and the Round-leaved Crane's-bill, *G. rotundifolium*.

A common plant on dry wastes and fallow fields is the Jagged-leaved Crane's-bill, *G. dissectum*, the leaves of which are cut into longer and narrower segments than those of any other species, with



SNEEZEWORT YARROW.

the exception of the one next to be mentioned. The flowers are few, produced in pairs at the top of the plant; they are of a pleasing pink colour usually, but vary considerably, as soil and situation affect them. The Long-stalked Crane's-bill, *G. columbinum*, is like the last in its deeply-cut leaves, but the flowers are larger, and borne on peculiarly long stalks, which give the plant a light, wiry appearance, in which it differs from all other species. The Stork's-bills are the close allies of the Crane's-bills; they bear smaller flowers, and the fruit has a longer, narrower, and harder beak. The Hemlock-leaved Stork's-bill, *Erodium cicutarium*, is the most common.

PROPAGATION OF ROSES BY CUTTINGS.



T is generally believed by amateurs and others that Moss, Provence, French, Damask, and Bourbon roses, etc., are difficult to increase by cuttings; but by the following method these sorts may be raised in abundance. Let a bed of well-fermented stable litter and leaves be made by the side of a north wall, and place a one or two-light frame on it, so as to face the north. In this put about eight inches of leaf-mould that has been previously well soaked with water; then spread over all about three inches of sharp pit sand, and make the whole firm and level. The back part of a span-roofed pit, running east and west, with a wall in the centre, is also a suitable place for the purpose. It should be filled to within a few inches of the glass with the same kind of material. In selecting the cuttings, tolerably weak wood of the present year's growth should be taken, if it is sufficiently ripened at the base, or has made one full-formed leaf. Strip the cutting with the finger and thumb, and smooth the base, reserving the detached portion of the parent bark; cut them close above the first leaf, and insert them in the sand, but not so thick as that their leaves will overlap one another. When this is finished, the bed should be watered, to settle the soil about them, and they should have plenty of air for the first four days; but it ought to be lessened by degrees, so as to gradually inure them to a confined atmosphere.

As the preservation of their leaves in a healthy state is essential to success, the bed may be formed, and the cuttings put in on the same day, without waiting until the material becomes heated, as a thin covering of cellular tissue should be formed over the wounded end of the cutting before that takes place. In the third week the greater part will be rooted, and in the fourth they should be potted off into 60-size pots, in a soil composed of leaf-mould and loam. They should be afterwards removed into a damp frame or pit, without any water being given to their roots; but they may be slightly syringed over their leaves, and when they become well rooted in the new soil, they may be hardened off and shifted into larger-sized pots, or planted out in a sheltered border, where they will make fine plants for the next year. By again levelling the surface of the beds, and making the cuttings to two eyes, always preserving one leaf, Tea-scented, China, Noisette, and Boursault roses, etc., will root freely in it, without any further preparation; but if a considerable quantity of the first-named sorts are required, either the old beds should be taken down and a little fresh fermented dung added, or a new one should be made, using the same sort of materials as are recommended above. The young wood should be taken before the blooms are expanded, and the cuttings prepared similar to what I have already described. The young shoots of what is called the second growth may also be used for cuttings. They should be taken when two full-formed leaves are made, moothed at the base, and cut down to the first leaf—then planted

in a bed of the same construction as above. When they are rooted, they may be hardened off and allowed to remain in the bed until spring. Plenty of air, in favourable weather, should be admitted. In this way they will occupy less room than placed in pots, and they will stand the winter better. Cuttings of roses, like those of many other hard-wooded plants, are more certain of rooting when they are made short, especially if a healthy leaf is attached to them, and kept there until they are rooted. This, however, can never be accomplished if the soil in which they are placed is subjected to the alternate action of wet and drought; but by placing wet leaf-mould between the dung and sand, an uninterrupted supply of moisture is obtained, and no water is required, from the time the cuttings are put in until they are rooted in the pots. So suitable is this treatment, that when the bud at the axil of the leaf has been damaged, or otherwise abortive, those at the root are excited, and suckers are produced. All kinds of roses will root freely under this treatment.

BALSAMS AND COCKSCOMBS FROM CUTTINGS.



HERE is certainly no great difficulty in raising and growing up to maturity both these beautiful subjects, if we procure good seeds of the best kinds; because plenty of heat, good composts, and repeated shifts, with the precaution of always growing them close to the glass, will bring them to perfection. But how often do we find that they are not naturally dwarf; that they will run away faster than we wish; and that the most beautiful flowers are occasionally upon plants which are not of the best habit.

On such occasions it is well to practise the plan of lopping off their heads, and striking them, because we are enabled to make our choice when their flowers are partly developed. I have this season been purchasing the best seed I could procure, with the intention of shining, if possible, in Balsams; but having, from various persons, obtained nearly forty different packets, all alleged to be "the best in England," and greatly varied in description, I devoted a large seed-pan to each kind, and pricked out three of each, which gave me a goodly number; and leaving the others in the pans, with the view of planting them out in the borders if I should use them at all. One party had advertised six varieties for 2s. 6d., in sealed packets, and a separate packet of straw-coloured Balsams, also sealed up. Perhaps I took more pains with these than others, for I picked them all out. When I saw, by repotting three of every sort, and growing them up to early bloom, that several of the varieties were worth growing, I naturally turned to the store-pans to grow them all. But they had grown a foot high, and were as thick, and I may almost say as thin, as mustard and cress. As plants they are totally useless. Unwilling to lose them, I took off all the tops, cut them up to a joint,

and used the ordinary means of striking them. I rooted nearly the whole of the choice sorts in bottom-heat, first picking off all the buds that I could get hold of, and soon found myself in possession of a quantity of dwarf plants, not three inches high, potted into 4-inch pots, and promising to be handsome. These have progressed to my entire satisfaction, and I can safely say that nothing strikes more freely.

I was moved to this practice by the result of an attempt last year to obtain a succession of Balsams when the plants had become ugly; for I then picked off the upper buds, took off the tops, about three inches long, and (somewhat carelessly, I admit, for I was busy), put them under bell-glasses, with the best bottom-heat I had. The result was that about one out of three rooted, and I had some fine dwarf plants, long after the others had seeded and died. I feel convinced that, had my bottom-heat been sharper, they would all have rooted. However, my experiment this year has so completely answered, that I am very likely to repeat the experiment.

With regard to Cockscombs, I have long practised the decapitation system. I allow them, after pricking out five or six round the edge of a four-inch pot, to grow till they show their bloom, and I then take off the tops of the most promising, so as to have only six leaves above the soil, put them at once singly into three-inch pots, plunge them all in the tan of a hothouse, and shade them for a week. I then place them as near the glass as I can, keep them well watered, and shift as soon as they reach the side with their roots. The leaves and flowers grow as freely as in seedlings; but when I give them the first shift, I transfer to a hotbed made on purpose, keeping them always as near the glass as possible. The leaves are of course close down to the pot, grow as large as ever I saw them on seedling plants, while the flower increases to a monstrous size—incredibly large for such dwarf plants. The only condition required is to let there be two inches of stripped stem below the six leaves we mean to form the plant, and let an inch and a-half of this be put into soil. They do not require covering with a glass, but there should be a genial heat in the tan; or, if they are struck in a hot-bed, let the pots be plunged until they have struck root, or for one week at least. Then they may be placed on the level surface.

I need not point out the advantage of this treatment. When we happen to have bad seed, yielding a straggling sort (or, as I have had this year, a batch not two of which come alike), it enables one to select a few of the best in a forward state, and to grow a few tolerable plants, when, by the ordinary means, there would be a total failure.

While upon the subject of Balsams and Cockscombs, I wish to remark that the notion which has long prevailed—that Balsam seed should be old to become double, or that old Balsam seed is better than new—is altogether erroneous. I have Balsams whose individual flowers are as double as a camellia or a rose, and these from a crop of seed saved by myself in September last. And I would also remark that they are very nearly true to the varieties they

were saved from. My Cockscomb seed was purchased from a London seed-shop, and I know nothing of its origin; but the plants, except those four cuttings, are all heights and colours, from yellow to crimson, and the foliage of scarcely two alike.

CORREA "BRILLIANT."



THIS is certainly one of the best kinds of Correas in cultivation. It has a striking effect in the greenhouse during the winter months. Its propagation is easily effected, either by cutting, grafting, or inarching. *C. alba*, being a hardy variety, with a vigorous habit of growth, is preferable as a stock. If short-jointed pieces of the young wood, in a half-ripe state, are selected for cuttings, planted in sandy peat, covered with glass, and placed in a close, cool situation for about a month, and then removed to a very gentle bottom-heat, they will soon root freely.

When the cuttings are obtained early in the season—but unless plants are placed in heat this will seldom be the case—it will be easy, with ordinary management, to have them rooted, potted off, and established in four-inch pots previous to winter; and in case that the cuttings are not fit for potting singly early in autumn, it will be better to keep them over the winter in the cutting-pot. When potted off, whether during autumn or spring, it will be necessary to keep them rather warm and moist till they have become established. In February, or early in March, place the young plants in a moist temperature of about 50°, and keep them properly supplied with water. As soon as they commence growing, examine the state of the roots, and shift into pots two sizes larger such as require more pot room. Water must be very carefully administered for a week or two after potting, and the soil, as well as the ball of the plants, must be in a proper state as to moisture when potted. If these important, although apparently trivial, matters are rightly attended to, the young plants will soon burst into vigorous growth, and should be allowed a free circulation of air during bright warm days. It will probably be necessary to regulate the growth by pinching out the points of any over-luxuriant shoots, so as to secure a compact habit of growth. The Correa, like many other hard-wooded plants, grows freely in a moist and moderately warm atmosphere; but when kept in a hot and dry temperature, the young wood becomes prematurely ripened, and ill health ensues. Perhaps the equal temperature and moist atmosphere most congenial to the growth of the plant is more easily secured, during the summer months, in a cold frame than elsewhere; but the removal must be carefully effected, and the plants should be kept freely supplied with air for a time, previous to the change, and the frame so managed as to maintain the temperature and atmosphere sufficiently warm and moist, to prevent them sustaining any check. During summer, a slight shade, on the forenoon of bright days, will be

highly beneficial, and the plants should be sprinkled overhead night and morning. Air should be freely admitted, except during the occurrence of cold drying winds, when the lights should be raised at the back only, and the temperature kept down by means of shading.

When the nights become warm, the lights may be thrown off late in the evening, and again replaced to protect the plants from the intense heat of the sun's rays during the day. The stronger growing specimens may require a second shift towards August or September, and this should be attended to as soon as the pots are full of roots. Discontinue the forenoon's shade early in September, and gradually expose the plants to the sun's rays, and the freest possible circulation of air, merely guarding them from heavy rains and autumn frosts. They should be removed to any airy part of the greenhouse about the middle of October, where they may remain during the winter, and will require no further attention than a supply of water and protection from frost. When they have done flowering, any straggling shoots should be cut back, and the plants may be treated this season as recommended for last; or, if rapid growth is not particularly desired, they may be removed to a sheltered, warm situation out of doors, instead of to a cold frame; but if they have been excited into active growth by a close, moist atmosphere, they must not be rashly exposed to the drying winds and bright sunshine which frequently occur in May. When greenhouse plants are removed to the plant-ground, they should be placed in a shady situation, and gradually prepared for full exposure to the sun and air. During summer they must be freely supplied with water, and a sprinkling overhead on the evenings of bright days will be beneficial. When the nights become cold, or drenching rains occur, they should be removed to the greenhouse, and be there freely exposed to sun and air. If it is desirable to have a portion of the plants in flower early in winter, they should be placed in the warmest end of the house, and kept as close as circumstances will permit. If treated thus, and if the young wood is properly matured, the plants will speedily be covered with bloom; and if they are properly supplied with water, they will continue in full beauty for many weeks. It will be unnecessary to place them in heat after the desired size is attained; but if the early flowering plants are induced to start into growth early in spring, they will be ready to blossom early in winter, and by these means a long season of floral beauty will be easily secured.

All *Correas* will be found to thrive in a soil composed of three parts fibry peat, and one part light sandy, turfy loam, with a free admixture of silver sand. The peat and loam should be carefully broken up into small pieces, divested of all inert soil and grassy litter, and carefully intermixed with the sand; and a sprinkling of clean potsherds, broken rather small, will assist to secure perfect drainage of the mass after the decay of the fibre has taken place. In potting, the soil should be made rather firm about the old ball, and should be in a proper condition as regards moisture when used. The plants will flower more abundantly if they are potted late in

the season, and, unless they are allowed plenty of root-room, their blooming season will be comparatively short; but those who are partially unacquainted with the culture of pot-plants will act a wise part in resting satisfied with a moderate display of floral beauty, rather than to risk potting their plants late in the season. With an annual shift, and attention to the simple hints which I have just laid down, this *Correa* will remain many years in perfection, and, by its abundant display of bloom during the winter months, will well repay the trifling care which its culture requires. When the plants become too large to be conveniently shifted, it will be better to throw them to the rubbish-heap, and to supply their places with young plants, as, if kept after they become pot-bound, they seldom flower satisfactorily.

DOUBLE BROMPTON, QUEEN, AND TEN-WEEK STOCKS.



EW hardy plants are more valuable than the different varieties of Brompton, Queen, and Ten-week Stocks, when double and clear in colour, either as objects for decorating the flower-garden or the sitting-room, both as regards their fragrance and long duration; and at the same time there are few plants upon which there is so much uncertainty. Very few persons care for the single stock, which in the double state is the admiration of everybody. I shall, therefore, endeavour to point out the surest means of obtaining double flowers, and at the same time show how they should be treated, so as to have plants in bloom from April to November, and even, in very mild winters, all the year round.

In commencing, first procure, if possible, seeds of a good kind (that is, from some place where more double than single ones are produced from the seed). for in so doing you may save yourself much disappointment. They are exceedingly easy of cultivation, merely requiring to be sown in a rich loamy soil, not very retentive, and at different seasons, so as to produce a succession. Those which should be put in at the present season, namely, the Brompton and Queen Stocks, should be sown at two different times; one about the end of June, and again in the end of July, in a border or bed not very rich or confined, merely screened from the mid-day sun. If such a situation is, however, not convenient, sow in the open ground, and put a few twiggy branches over the beds, placing the branches flat on the ground, which will be quite shade enough, removing them again as soon as the young plants begin to show their first rough leaves; otherwise they become drawn, and consequently never flower well. In sowing the Brompton and Queen Stocks, always sow rather thinly, and on ground which is somewhat firm; for, if sown on very loose, fresh-dug ground, and if the soil is rich, which it should be, the plants grow too rapidly, become soft, and are very liable to be destroyed in winter if the latter should

prove severe. When large enough, which will be by the beginning or middle of August, transplant them into a moderately rich soil, and water freely after planting if the weather is dry ; but, if possible, defer planting until showery weather. In making a selection for transplanting, first reject all the very strong-growing plants, because they are almost sure to be single ones, and also those with a single tap root, preferring only the smaller and stunted plants with horizontal fibry roots, as these in most cases produce double flowers. In planting at this season, much of the success depends upon the kind of winter which follows ; and it is a very good plan to plant one portion on very poor soil, to stand if the winter should prove very severe, and another on rich soil (these should be the produce of the latter sowing), to produce fine flowers, in case the following winter should prove very mild. These plants will flower from the end of April to the middle of July, or even longer, and should be supplied with manure water once or twice in April and May, particularly if planted in rather poor soil. The next sowing should be of Ten-week Stocks, for potting or keeping in cold pits or frames during winter, to be afterwards turned out into the open border about the end of April. The seeds of these are best sown on a good rich border, about the beginning of September, in the same manner as those of the preceding, and a selection should be made in the same manner, rejecting the very strongest and tap-rooted plants as much as possible. When the plants are sufficiently large, pot them in five-inch pots (43's), putting three or four plants into each pot, round the side, and in very rich compost ; they must be shaded for a very few days, and afterwards placed in a somewhat sheltered situation, so that they may remain out of doors as long as possible before they are placed in the pit for winter ; otherwise, if placed in the pit or frame too early, they get drawn, or lose their bottom leaves, and become unsightly. In spring, as soon as they begin to grow, allow plenty of air, and remove the lights entirely in very fine days, watering frequently with manure water, or, what is better, placing a portion of rotten dung on the surface of the pots. When the plants begin to show for bloom, the single ones can at once be pulled out, leaving only those that are double ; these plants will flower in April and May. In sowing in spring for a succession to flower from the middle of July until September, sow the various kinds of Ten-weeks in the open border, in very rich soil, about the middle of March, and thin out the strongest plants at first, and afterwards all the single ones, as they show bloom (unless you want them for seed), and by the end of July you may have nothing but a bed of double stocks ; by transplanting some of the smaller plants about the end of May into very rich soil, you may have a later succession of bloom ; and finally, if some purple and white Queen Stocks are sown at the same time, and treated in a similar way, they will commence flowering in August, and remain in beauty until they are destroyed by winter weather.

If the winter should not prove severe, however, these plants will keep on blooming until those sown in July take their place, thus producing a constant succession all the year round. In many cases the

June.

most beautiful of all the kinds of stocks, the Bromptons, get killed by the severity of the winter ; but this may be avoided by taking up the plants before winter, and potting them, or by planting them in spare melon pit or cold frame, and afterwards replanting them into the open ground in spring ; but they never flower so well or grow so large as when they survive the winter in the open border. In saving the seed much depends ; for stocks, as well as all highly domesticated plants annually reproduced from seed, are very subject to degenerate, and it requires a constant vigilance to preserve or improve the race. I shall now endeavour to find out what is the best means of obtaining double flowers with good colours. In selecting the plants from which to save seed, choose always those with brightest and clearest colour, broadest petals, densest flower-spikes, most numerous side branches, and dwarfest habit ; and avoid all those plants with few lateral branches, robust habit, thinly-set flower-spike, and broken colours. Much also depends on the season ; for if the summer should prove a very dry and warm one, the seeds will be much better as regards the production of double flowers ; while, on the contrary, if the summer should prove to be cold and wet, nearly all the plants will be single ; and this accounts why the German-saved seed is always superior to that saved in England. It should also be observed that the seed of each colour and kind of Stock should be saved at as great a distance from the other as possible ; otherwise bad colours are the effect. The bottom flowers on the spike only should be allowed to produce seed, which is easily done by pinching the top ones off ; and, finally, the best seed is obtained where large quantities are grown, and where the plants are allowed to remain where sown, and treated as above stated. There are some who suppose, because a plant with single flowers be surrounded by double ones, it must produce seed from which nearly all the produce will be double ; but I need hardly say that such is not the case, for the quantity of double flowers has no effect upon the single, but merely indicates that the breed is a good one.

ADAMIA VERSICOLOR.



OR some time after the introduction of this plant, it was generally complained of as being a shy bloomer, and some persons still experience the same difficulty in its culture.

It certainly cannot be considered a first-class plant, the flowers not being high-coloured nor very showy ; but with proper management it is a most profuse bloomer ; its hydrangea-like heads of flowers being produced in succession for months, and remain long in perfection ; and when seen in the form of a well-grown specimen, with every shoot terminated by a head of flowers, it is well deserving of a place in even select collections. Propagation is readily effected by means of cuttings of the young wood in a rather firm state. These should be selected as early in the season as they can

be obtained, and planted in light sandy soil, covered with a bell-glass, and afforded a gentle bottom-heat. In the course of about a month they will probably be found to have struck root, and as soon as this is the case, they should be potted singly in small pots; for keeping them in the cutting pots longer than is absolutely necessary, tends to produce a weak habit of growth, and in all cases this should be avoided as far as possible. The young plants should be placed in a close, warm, moist place, and carefully shaded from the sun for about a fortnight after potting singly, by which time they will have taken to their pots, and may be treated as established.

After this they should be placed in a closed pit, or moderately warm house, keeping them near the glass, and syringing them overhead on the mornings and afternoons of bright days. Being of a very free habit of growth, if all goes on well, a shift will soon be required, and they should not be allowed to suffer for want of pot-room in this stage, but should be shifted into pots two sizes larger as soon as they require it, kept moist, and rather close until the roots strike into the fresh soil. When this is the case, give air freely on every available opportunity, in order to induce a strong compact habit of growth, and, if necessary, to keep the plants bushy, stop the leading shoot; but if a vigorous root action is maintained, stopping will hardly be necessary.

Where the object is to grow large specimens before flowering, the plants should be kept growing as rapidly as possible during the summer and autumn, affording them pot room as may be necessary, and a gentle bottom-heat would be of great assistance towards inducing rapid growth. The best situation for them in winter, will be an intermediate house, where the temperature may range about 50°, for they should not be checked, either by too low a temperature, or the want of water, as this would probably produce a tendency to flowering, and cause some difficulty in getting them to start away freely in spring, and neither should they be kept as warm as to encourage growth. About the beginning of March will be the proper time to place them in growing circumstances, and with suitable convenience and attention, fine plants will be easily secured by the autumn.

They should be placed in a gentle bottom-heat, kept near the glass, and as soon as growth commences, the roots should be examined, giving a liberal shift if necessary. Keep the shoots nicely tied out to prevent their growing too closely together and injuring each other; and make sure of having the specimens well furnished towards the bottom. A second shift will probably be required towards May, and this should be into the flowering pots, the size of which must be regulated by circumstances; a fifteen-inch pot will be sufficiently large for a fine specimen, and will, no doubt, be found large enough for plants of but two seasons' growth. Stopping must not be practised later than the middle of August, and the plants should be kept rather dry at the root, and more freely exposed to air from the end of September to the middle of November, which will mature the wood, and prepare it for flowering. By placing them in heat, and supplying them liberally with

water, they will soon show flower at the end of every shoot, and if removed to a close part of the conservatory just as the buds begin to assume their blue colour, and protected from damp, they will remain in this state for some three or four months, for they will hardly open in the temperature of the conservatory, and in this state they will have a very pleasing appearance.

The flowers will, however, open freely in the temperature of an intermediate house, where, if the roots are well supplied with weak manure water, and a moderately dry atmosphere maintained, they last long, and, on plants that have been properly ripened, will be produced in succession from the side shoots for months.

Specimens intended to be grown on for further use, must be cut back in time to allow of their making a short growth before winter, and should be repotted every other year; but by supplying them liberally with manure water, they must be kept in health in good-sized pots for several seasons without repotting. The best soil for this plant is three parts good strong fibry loam, and one part peat, or leaf-soil, mixed with a proper quantity of sand and lumpy bits of charcoal, to keep it open and porous; for if grown in light, rich soil, the wood is apt to be long-jointed, and the specimens rather inclined to straggle.

GARDENIA.



THIS is a lovely and well-known genus of plants, which are extensively cultivated for their odoriferous properties, as well as for their beauty. It is scarcely possible to single out a more attractive tribe than this, or one that is a greater favourite with the public. *Gardenia radicans*, *G. Florida*, and *F. plena* (the well-known Cape Jasmine), are inhabitants of every hot-house, and, during summer, we may add, of almost every drawing-room.

In the bouquet, also, the addition of a flower of this plant diffuses a most delicious fragrance.

According to Thomberg, the notable Cape Jasmine is highly esteemed with the Japanese; they form hedges round their dwellings, and introduce it with great profusion in their gardens. *Gardenia Rothmannia* is a spotted species of considerable beauty; its fragrance is most sensibly diffused during night.

It is a plant of great excellence, and, like the following, deserves a place in all choice collections. *G. amoena* is an interesting stove shrub, of dwarf habits, retaining its natural spines very often under cultivation in this country. All the species are more or less prickly in their native state, but they apparently lose this when they are subjected to a higher degree of artificial cultivation. There are other species of *Gardenias* known to our gardens, although not cultivated, being either less remarkable for their beauty or their fragrance. The propagation of the *Gardenia* is exceedingly simple;

half-ripened shoots of the current season planted in sandy peat, and placed in bottom heat under a hand-glass or bell-glass, will root with certainty in a short time.

They should then be gradually exposed to the air of the house; and when well established, they should be potted in three-inch pots; then plunge them into bottom-heat, with partial shade, and promote their growth in a rather high temperature, keeping up an abundance of moisture. By pursuing this system, fine bushy flowering plants may be produced the second season; but the cultivation of this lovely plant must not rest here. We ought not to content ourselves with merely producing plants in six-inch pots, such as are brought to Covent Garden market; for there is scarcely anything more attractive or more desirable than a well-grown specimen, in full flower, of either of the *Gardenias*. The soil most suitable for their successful culture is a part of our subject of great importance, for to the want of due attention to this may be ascribed many of those miserable-looking objects which disgrace our collections. A suitable compost may be made of the following materials: One-third turfy peat, one-third leaf-mould, and one-third thoroughly decomposed cow-dung; let these be well intermixed with an addition of one-sixth of the whole of pure silver-sand. Let the principles of draining and potting, pointed out in the former articles, be strictly adhered to, and let the following directions be put into practice, and the result will be satisfactory. Supposing a plant is required in all its beauty in summer, and this is only the natural season when any plant can be brought to perfection, place the plant in a close pit in early spring after being potted, and plunge the pot in a genial bottom-heat of 80° ; maintain a degree of 60° in the pit by night; keep up a moderate but constant moisture, as the *Gardenia* delights in a warm and humid atmosphere, and with such encouragement the growth will be kindly and luxuriant.

As the season advances, increase the temperature of the pit a few degrees, until it reaches 75° or 80° by night, and increase the size of the pot, should such appear to be necessary. This will scarcely, however, be requisite, as one good shift in a season will generally be sufficient for *Gardenias*. Keep the soil in the pots moderately supplied with *tepid* water, but as vapour is constantly escaping, the supply of water to the roots must be carefully and relatively administered.

A little liquid manure may also be beneficially applied during the period of rapid growth, and until the flowers make their appearance. This will be the time to begin to expose the plant gradually to a lower temperature, for it is only in the temperate climate of a greenhouse or drawing-room that this plant can be sufficiently estimated and enjoyed. When the flowering season is past, it should be followed by a season of repose, and the supply of moisture in some measure withheld, and this partial suspension of the active functions of the plant will advance the ripening and hardening of the wood, which has been produced in an extremely excitable atmosphere; and this at the same time will promote the accumulation of

resources for future elaboration and development. No plant can, with impunity, undergo constant and uninterrupted hard forcing without producing constitutional debility, disease, and death. In nature every plant has its season of rest, and if we in artificial management drive cultivation to its utmost limits, we must on no account alter the immutable laws which maintain and perfect every vegetable production. Should our object be to have these desirable plants in beauty in early spring, we should commence in November following with the system previously detailed, and those plants which were earliest excited the previous season will be the most suitable to commence with.

TABERNÆMONTANA CORONARIA FLORE PLENO.



THIS fine stove shrub has long been common in well-managed collections, although it is not so generally cultivated as it deserves to be. Its large white flowers are hardly inferior to those of the *Gardenia* in fragrance, and last longer in beauty, and are produced very thickly under proper management. Being a native of the East Indies, it requires a warm, moist temperature while growing, with a liberal supply of water at the root; but when the wood is formed, from which flowers are expected, it must be subjected to a period of cool dry treatment, to thoroughly ripen the wood, which is essential if a good display of blossoms is wished for.

By the exercise of a little forethought and attention, to get the wood properly ripened, and allow the plant a period of rest, it may be had in bloom at any time from March to November, as properly-ripened wood will never fail to produce flowers.

Young plants should be placed in a moist growing temperature at about 65° by night, and 75° by day, as early in spring as circumstances will admit; and if they can be afforded a bottom-heat of about 85°, this will greatly assist in promoting active growth. At this season the plants should be kept near the glass, and afforded all the light possible, admitting air whenever the state of the weather will permit, in order to prevent long-jointed weakly growth. If dwarf short-jointed plants have been selected, the points of the shoots may be pinched out, tying the latter down to induce the lower buds to start, but if the plants are straggling they had better be sufficiently cut back to secure a close habit.

Shifting must be attended to as soon as the pots are moderately well filled with healthy roots, using pots one or two sizes larger, according to the vigour of the plants. If in bottom-heat, great caution will be necessary, for a fortnight or so after potting, to apply water properly: for when the pots are plunged, it is not easy to judge of the state of the soil, as when they are exposed; and so little is required in this case, that beginners are very apt to water too frequently, and many a promising plant is thus ruined. Care should always be exercised to ascertain the state of the soil, before

giving water, and there should be no dribbling, or mere surface watering, but enough should be given to thoroughly moisten the ball, giving no more until it is absolutely wanted. As the season advances, it will probably be necessary to afford a slight protection against bright sunshine, but only a thin shade should be used, and this as sparingly as can be safely done.

As soon as the pots are found to be well filled with roots, give a second shift, unless that should be the case until towards the end of the growing season, when it will be better to avoid shifting till the following spring.

Maintain a thoroughly moist atmosphere, and syringe the plants over-head on the mornings and evenings of bright days in summer, and also keep the shoots regularly tied out and stopped, as may be necessary to secure a compact bushy habit; but in case of plants intended to bloom the following spring, stopping must not be practised later in the season than will allow of getting the young wood properly matured before the winter.

If the plants can be placed in a pit or house where the temperature may range about 55° , this will form a suitable situation for them in winter, and if proper care has been exercised to get the wood well ripened in autumn, the night temperature may be allowed to fall as low as 45° in hard weather. Give very little water to the soil at this period, only just sufficient to preserve the roots in a healthy state, but draw the syringe over the foliage occasionally on the mornings of a bright day, so as to clear it of dust, etc. If it is intended to grow large specimens before allowing the plants to flower, place them in a moist temperature of about 65° by fire heat, as early in the spring as circumstances will permit, and afford them a brisk bottom-heat, to induce them into a vigorous root action.

See to the state of the roots, and shift before these suffer for want of pot room, also keep the shoots tied out and stopped as may be necessary to secure bushy growth, and otherwise treat the plants as recommended for last season.

While in bloom the specimens may be placed in a cool house, but they must be carefully guarded from damp in the atmosphere, and after flowering they should be cut back as may be required, and re-potted; but with an occasional watering with manure water during the growing season, they may be kept in good health without re-potting. For soil use good fibry peat and loam, in the proportion of three parts of the former to one of the latter, adding a sufficient quantity of silver sand to ensure a free percolation of water through the ball after the decay of the fibre. Cuttings of moderately young wood soon root if planted in sandy soil, covered with a bell glass, and afforded a sharp bottom heat of 80° or 90° .

AQUILEGIA GLANDULOSA.



THE stock from which I cultivate this beautiful flower was raised from seeds produced about ten years ago, from a plant which appeared much more robust in habit than common, being taller in growth and larger in the blossoms than any other of the species which I had previously observed. Plants may be multiplied by cuttings, and by dividing old roots, but these never flower freely, and are unworthy of cultivation. Propagation by seed is the only method practised here; and it is worthy of remark that, unlike other *Aquilegias*, seeds of this plant have never been known to produce many varieties; and difference even in strength of growth or size, under the same treatment, is very rare.

Sometimes a double-blossomed plant is to be met with, but it has been found that that distinction is neither permanent in the plant itself, nor in the seedlings it may produce. Of many thousands of seedlings in bloom here, I cannot perceive the slightest variety. As this *Aquilegia* is quite hardy, it is cultivated as an open ground plant, and from the middle of May to the end of June, it is by far the most gay and attractive object of the season. The flower-stalks usually rise to the average height of from fifteen to twenty inches, and very seldom exceed two feet. Seedlings sometimes flower the second, but more commonly during the third summer of their growth. The first time the plant generally yields eight or ten blossoms, and for several years the number increases greatly. I have just counted seventy-five on a plant six years old. When plants attain the age of seven or eight years, they generally get exhausted, when their flowering becomes very uncertain, and only here and there a flower-stalk is produced; consequently such are unfit for forming a bed or clump in the flower garden.

The ground should, therefore, be cleared of the old roots, and young plants inserted. The seeds of this plant are usually ripe about the beginning of the autumn, and may be sown any time before the end of March; when sown in autumn, some plants generally appear above ground in a few weeks, but the principal part commonly remains dormant until spring. Such as get up in autumn generally require to be protected, lest they be ejected by severe frost during winter.

It is not unusual for seeds of this plant to vegetate after remaining in the ground for twelve months. In a bed where a moist heat is applied, the seeds spring more readily, but under any circumstances they are more stiff to vegetate than any other *Aquilegia*, and rise far more unequal than any other plant we know. The ground for seed should be rich and friable; moisture and shade are found to be preferable to deep covering.

The soil which I have found most suitable for the growth of the flower, is a rich mellow earth, partaking a little of bog or peat earth, and rather cool and moist than otherwise, approaching to that usually termed swampy. In such, I have had the same plants

flower most vigorously for six or seven summers, with many blossoms nearly five inches broad. But I have flowered plants very well for two or three years on rich, dry, sandy ground; on such, however, they soon cease to flower freely and become worthless. I am satisfied that the age and condition of the plant is of more importance than the quality of the ground. The nurseries here comprehend soil of almost every sort, common, and of very opposite qualities, and I have never failed in flowering young plants well for a few years on spots apparently very unsuitable.

When seedling plants have grown one summer, I remove the strongest of them, and transplant them into beds, or lines about a foot apart. Plants of equal strength commonly flower at the same time, and appear last; any time between September and April admits of their removal, but if the plants are strong enough to flower the first summer, they should be removed before the month of March. Those that remain in the seed-bed are fit for being transplanted after the second summer's growth, when they are classed into sizes in being removed. Such as are thinned out and left at distances for flowering in the seed beds, are very seldom found to be so vigorous as those that are early removed. After the plants are three years old, they do not admit of being transplanted with much success. I have known old plants which, after being removed, would produce abundance of foliage, but not one flower in ten years. Such is the propensity of this beautiful plant. When cultivated as greenhouse plants, they should be inserted, when one year old, into six or seven-inch pots, and kept very moist during the progress of the flower-stalk, which commonly begins and ends its height in the month of April. The best specimens, however, are generally from the open ground.

DISBUDDING FRUIT TREES.



N disbudding fruit trees it should be borne in mind that every cut with the knife, and every pinch of the finger and thumb, technically termed "stopping," exercises, for a time at least, a corresponding amount of restriction on the root. Indeed, it would be no difficult matter to convert a young forest tree into a mere bush by commencing and rigidly pursuing such a course for the first seven years of its life. One of the first points to appreciate, with regard more especially to trained trees, whether by the fan mode or horizontally, is the continual tendency of the main leaders of such trees to establish a new leader in the most perpendicular direction, or where the most spacious sap vessels exist. This is of course a mere consequence of an immutable law of nature, which in the main impels the shoots of trees upwards. Now it is perfectly obvious that when the main flow of sap obtains a new channel of this description, that such must be at the expense of the buds; and more especially the fruit situated near the terminal points of the horizontal or fan branches. The winter Nelis Pear, and the Passe Colmar, are pretty

good instances of this habit. It is pretty obvious then, I think, that the first act of disbudding should commence with these decoys. The season being young when this operation becomes requisite, all further disbudding should stand over until midsummer, when I hold it absolutely necessary to proceed in a progressive way, with the other portions of the tree.

The next point is, to go over the whole of the leading shoots, and remove all over-luxuriant sprays, without exception; leaving, perhaps, a couple of leaves at the base of each spray. The amount removed will in ordinary cases comprise about one-half of the young spray; this, however, depends upon the character and age of the tree, for in the case of one old or hard-worked, I hold it essential to permit a much greater amount of shade through the instrumentality of new-made wood; indeed close stopping of such trees would soon destroy them altogether.

Exceptions must, however, be again made here, as to the habits of the tree in question; for in running the eye over our orchard or kitchen garden fruits in general, two distinct groups will present themselves; the one bearing in the main on natural spurs, the other chiefly on the young wood. These broad distinctions must of course be kept in view at all times. Again, even in one family—for instance the Apple—one kind will bear the finest fruit on last year's wood; and the fructification of such wood is in proportion to the amount of grossness.

An illustration of this will be found in the Manks' Codling. The Nonpareil class, on the contrary, generally produces on the spur. I am now, however, treating of over-luxuriance as an evil. This forms the rule, and requires most elucidation. To return, then, to my point of digression, the removal of all the over-luxuriant spray about midsummer will be found to control, in a very powerful degree, the under action of the root. Some of the embryo fruit-buds may be excited into wood, especially in showery weather; this, however, must be borne; for those that remain unexcited will be found much strengthened, and to develop a much more perfect blossom in the ensuing spring.

We frequently see imperfectly-formed blossoms on tender fruit trees in the spring; and why? because the embryo blossom-bud never received its necessary amount of light during its organization. It is not so much heat, of which an increased amount is requisite, but light. Some good-natured country folks think this is carrying an idea too far; rather too philosophical, they think. The writer, however, with all due respect, thinks differently. Instance the Melon; it is very probable that the Persian Melons enjoy as much light in one day in their own climate, as those in the murky skies of Britain do in a week. To be sure a bright sunny day in our own climate is light enough for anything; but behold how many cloudy, drizzly, or rainy days may be placed against such a state of weather. The tender incipient buds of fruit trees, natives of brighter skies, become what is technically termed "drawn" when smothered with young spray, and hence the abortions and malformations of the succeeding spring. A midsummer's disbudding will not, however, complete all that is

necessary; a stopping, in addition is, in most cases, necessary. First, it seems to concentrate the powers of the tree, thereby producing fruit of a larger character; second, it tends to equalise strength in trained trees, provided the most luxuriant alone are stopped; third, it tends to ripen the individual shoot acted on; and, fourth, it exercises a further amount of control over the wayward root; which, in the case of the Peach or Nectarine, frequently impels the young shoots to a September growth. I need scarcely urge that such cannot possibly benefit the tree. The vast difference, therefore, between a course of summer's pruning, and that of winter, should be kept steadily in view by young aspirants in fruit culture. A severe winter's pruning excites the wood; that of the summer ultimately checks such a tendency. Our spur-bearing fruits are in general much injured by succulent spray; and it should be borne in mind that the wall-tree receives in the main less light in the aggregate than the ordinary espalier. This may appear a very disputable matter to some persons; but I feel persuaded that such is the case, more especially when we consider that the root in the former case is generally so placed as to receive a greater amount of nourishment—that is to say, in proportion to the amount of perspiratory surface of leaf.

The ordinary standard grows, perspires, and of course elaborates uncontrolled from a much greater amount of leaf; whilst the severe curtailment necessary with the wall-tree, destroys in a considerable degree that reciprocity which should exist between the absorbing and elaborating powers.

BORONIA SERRULATA.

BY A CORRESPONDENT.



ALL the Boronias are handsome, but this one is an especial favourite of mine. In choosing a plant from the nursery, let it be dwarf and bushy, and take care to keep it healthy and vigorous until the time has come round for potting it. Commence that operation in April, by preparing some nice light fibrous peat mould, beating it well to pieces. When this is done, sift it through a coarse sieve, to deprive it of the coarsest roots. Then add about half the quantity of silver sand, and a portion of clean broken potsherds, which will keep the soil open, porous, and healthy. Mix these well together. Then prepare a clean dry pot, well draining it with potsherds, upon the top of which put some of the coarse roots that were rejected when sifting. Place your plant upon the top, calculating the depth to put the ball, bearing in mind not to sink the collar of the plant too low, but to have it rather elevated above the level of the surface when potted, pressing down the soil somewhat closely. When potting is finished, place the plant in a greenhouse or pit; I prefer

June.

the latter, as it affords better means of supplying its wants, and you have a much better command over the temperature in a pit than in a greenhouse. When placed in a nice dry pit, keep it close for a few days. If the sun should be bright, shade in the heat of the day, but not too long. After two or three days, begin to give a little air by lifting the light behind, and increase the quantity as the plant advances in growth, bearing in mind never to expose it to draughts or cutting winds; for, rest assured, if you do your plant will soon become brown and sickly. Pay great attention, likewise, to watering, which is another important point. Never allow it to become dry. When it is perceived that it has begun to feel its shift (which its appearance will readily indicate), give a gentle syringing overhead in fine bright weather, and close your pit in good time in the afternoon. In the course of a month or six weeks, the plant will have made vigorous growth, and now is the time to form a fine specimen. When it is receiving the full benefit of its shift, and throwing out strong and vigorous wood, give it a regular topping, and prune it into what shape you may prefer. Take the points off every shoot. Some of the strong ones may be topped as much as three inches, others only two, and some even less, always using your own judgment in this matter, and topping according to the strength of the branch. When this is done, place the plant again in the pit, syringing it frequently, and in a short time it will break forth regularly all over, and form a splendid specimen. When it has made growth from three to four inches in length, begin gradually to give more air, and follow this up until autumn. When the time has arrived to place it in its winter quarters, after you have hardened it and retarded its growth, on a very calm mild day, you may take the lights entirely off, but never allow them to be taken quite off during cold stormy weather. I have seen many growers expose their *Boronias* out of doors, along with other greenhouse plants; but I cannot agree with them in this practice, as I certainly never saw a plant subjected to this treatment which kept long in health; they become brown and rusty in foliage. I am certain that the constitution of this species is too delicate to be kept in health long, if exposed to winds or rain. When you place it in its winter quarters, make choice of a nice light situation in the greenhouse, as near the glass as can be conveniently found, but not exposed to draughts.

Be very particular in watering during the winter, and never allow it to become too dry. Here it will soon begin to show its bloom-buds from top to bottom, and, by keeping your house moderate in temperature, never allowing the frost to enter, nor, if possible, raising it above 50°, it will push very gradually, and open blooms about the month of April or May, of the most beautiful colours. There are several other species of this genus, and most of them are indispensable to fine collections of plants; but all the others will thrive well under the treatment I have just been describing, until they have made their summer's growth, when they may all be exposed to the open air, which will strengthen and harden them for their winter's rest. By no means, however, allow

any of them to remain out during drenching rains, although none of them are so tender as *serrulata*; and in placing them in the greenhouse for the winter it will not be necessary to be so particular in choosing a place for them as in the former case, as they are not so delicate, provided they have a nice, airy, light situation, and are wintered moderately dry. Most of the *Boronias* are very liable to the attacks of mildew, which, if not kept down, will ultimately destroy the plants. This frequently makes its appearance in autumn, after, and sometimes before they are placed in their winter quarters. As soon as it is perceived, apply sulphur, which entirely destroys it. I have always found sulphur efficient, and I have made a practice, every autumn, of dusting the plants all over with it, and allowing it to remain upon them until spring, when a syringe and some clean water will remove it, and they then look green and healthy.

THE GENUS CYTISUS.

BY A CORRESPONDENT.



THE species and varieties belonging to this genus are among the gayest and most easily cultivated of our winter and early spring flowering plants, producing, with ordinary management, an abundance of bright-coloured cheerful-looking flowers, for some three months in succession; and for amateurs, having only a small collection of plants, nothing could be more useful. Beginners should commence with young plants, of *C. racemosus*, for instance, which if procured at once, will form nice little specimens for blooming in spring; they should be placed in a cold frame, or a cool airy part of the greenhouse, giving them plenty of water at the root, syringing them overhead on the mornings and evenings of bright days, and keeping them near the glass, to induce close, short-jointed growth. If the pots are found to be well-filled with roots, which, in the case of healthy plants received from the nursery, will be sure to be the case, give a liberal shift, say into pots two sizes larger than those in which they have been growing.

For soil, use about equal parts of good, rich, light turfy loam, and strong fibry peat, broken up, so that it would pass through a half-inch-mesh sieve, and well intermixed with sharp sand, and some lumpy bits of charcoal, to keep the mass open after the decay of the fibre. Care should be observed to thoroughly drain the pots, for the plants will be found to require a very liberal supply of water; and unless perfect drainage is secured, the soil will be apt to become sour towards the bottom of the pots. Beyond the ordinary routine of watering, syringing, etc., very little attention will be necessary during the growing season; but if a spider should make its appearance, no time must be lost in eradicating it, by laying the plants on a clean mat, and thoroughly washing the under sides of

the leaves with the syringe; this operation, repeated twice a week for a fortnight, will generally be successful, unless when the plants are growing in too warm a situation, and in this case it will be nearly impossible to keep them free from this pest. If any branch is observed to be taking a decided lead of its fellows, it should be stopped, and the main shoot should be kept neatly tied to a stake; this is supposing that the object is to obtain a well-furnished pyramidal bush, which is decidedly the best method of training; but if any other form is desired, it will be easily obtained by timely attention, for the plants being vigorous growers, are easily trained, with a little care, in any shape. If the plants can be kept near the glass in a light, airy situation, so as to induce short compact growth, they may be kept growing till late in autumn, but they should not be kept too close at this season. They may be wintered in a cold pit or wherever they can be protected from damp, for a few degrees of frost will not injure them. After they have bloomed in spring, allow them to stand in rather a cool place for a fortnight, then cut in the shoots slightly, and place them in a moist and rather close spot, to induce the buds to break freely, and when the young shoots are about an inch long, repot, giving a liberal shift, using the same soil, etc., as already recommended, and retain them in a growing temperature, syringing freely, until the roots get hold of the fresh soil. When this is the case, they may be more freely exposed to air, and, as soon as the weather permits, remove to a sheltered situation out of doors, where they will not be exposed to the mid-day sun. Here they will grow freely, and will not be so liable to be infested with red spider, as in the greenhouse.

With a little attention it is easy to have these plants in bloom at almost any time during the winter, but to effect this, they ought to be started into growth sufficiently early to allow of having the young wood firm by the middle of September, after which time the plants should be freely exposed to the sun, and not overwatered at the root. Treated in this way, they will commence flowering immediately they are placed in a moderately warm greenhouse, and if supplied with manure water, they will bloom profusely for a long time in succession. When the specimens become too large to be conveniently repotted every season, supply them liberally with manure water while making their wood and blooming, which will preserve them in sufficient vigour for several seasons; or they may be slightly disrooted every year, repotting them in the same sized pots, and using very rich soil.

KILLARNEY FERN. *TRICHOMANES RADICANS*.—*E. A. W., Kilderminster*.—This fern should be grown in a soil of very sandy peat, say peat and silver sand, equal parts, mixed with small blocks of stone, to which the roots like to adhere. It should be grown under a bell-glass, or in a case, but should not be planted with ferns that need ventilation. Keep it moderately moist at all seasons, take care that the sun never shines upon it, and, as far as possible, making allowances for curiosity, give *no air at all*.

REMARKS ON FRUIT TREES.

BY A SUBSCRIBER.



VERY gardener at this season of the year is looking with great interest to his fruit trees, endeavouring to divine what kind of a crop each is likely to produce. This important question cannot always be decided by the presence of abundance of blossom, for many causes may render abortive, trees which have been covered with beautiful flowers. Frost may yet commit ravages; blight may make the young fruit to fall prematurely; and even the excess of production may so weaken the powers of vegetable life, that a crowded exhibition of bloom may end in sterility.

It is too late now to suggest precautions against frost, nor can we do much in preventing the damage done by blight except it is by picking or washing off insects as they appear. But the last occasion of a deficient crop comes under our own control, and deserves at this time the thoughtful consideration of the gardener.

When the florist wishes to have fine flowers at a horticultural exhibition, he allows only a few to grow on the plant, which receive the energies which would otherwise be expended on the perfecting a greater number.

For the same reason wall fruit is thinned when too many are set to allow of all to be large and fine.

This principle, generally well understood and acted upon, is little thought of in reference to an overcrowded display of blossom. Fruit trees are covered with one mass of flower, and we congratulate one another on our excellent prospects. But a little consideration will show us that, if too many set fruits may injure one another, too many blossoms may come under the same category.

It has been recommended to thin out the blossoms of pear trees, in order to secure a crop, and the advice is philosophic. In the case of trees whose fruit grows separate, as apricots and peaches, this necessity is not so pressing; but when it appears in a cluster, as with the pear, it is obvious that there is danger of one pushing off its neighbour in the act of growth. I have a pear tree at the corner of the house with a southern and eastern aspect, so that the tree in spring has two different climates to grow in. It is always covered with blossoms, and makes but little wood. It would appear as though a crop should be secured on one side or other of the tree, but in five years we have gathered only four pears. Having read the advice to thin out the blossoms, I ascended a ladder when the tree was in bloom to reconnoitre and form my own opinion on the subject. The clusters of flowers I found very large, some having as many as twenty on one stem. The lower row, which blooms first, was set, while the upper tiers were scarcely in flower. I pinched all off but the lower row, consisting of three or four blossoms, and I now hope to succeed better. However, if I do not, the principle will not be altered, and I shall attribute the failure to a cause yet to be discovered. It is manifest to me that with such a crowding of blossoms, all ran a great risk of being shouldered out of their places.

THE APHELEXIS.



THE varieties of this useful genus are all rather free growers, and, with moderate care, form compact, handsome specimens; but, like the majority of hard-wooded plants, they are apt to suffer much from improper treatment—such as over-watering during winter; allowing the soil to become dry in hot weather; exposing them, when in a soft state, to sudden atmospheric changes; allowing them to become pot-bound, and permitting them to remain several months in that condition; thus giving them a large shift, and applying water carelessly afterwards.

Cuttings made of firm young wood root freely enough, as does also bits of ripe wood having several shoots. They should be put in early in spring, planted in very sandy peat, covered with a bell-glass, placed in a temperature of about 55° , and, if properly cared for as regards water, and guarded from damp, they will soon emit roots. If ripe pieces of wood are used, they will be longer in emitting roots than young cuttings, but they will form plants sooner. Beginners will save time, however, by procuring young plants from the nursery at once; and if strong dwarf little ones are obtained, they are well worth what they usually cost. Supposing young plants to be obtained now (although too late to get a good season's growth), let them be placed in a cold frame or pit—or near the glass in the greenhouse will do—and be screened from the full force of the mid-day sun, and afforded a moist growing atmosphere. If the pots are moderately filled with active roots, give a shift at once into pots one or two sizes larger, according to the health and vigour of the plants. Keep the atmosphere rather close, and as moist as can conveniently be done, for a fortnight after shifting, and give water to the soil sparingly until the roots strike into the fresh material. As soon as they have become fairly established after potting, they should be freely exposed to air, night and day, merely screening them from the mid-day sun, and shutting them up for a few hours in the evening, after syringing them; but the night dews will be beneficial; and, if in a cold pit, the lights may be drawn off at night, except when there is any indication of a storm. Stopping and regulating the shoots must also be attended to, and most of the varieties require frequent stopping; but this should not be done immediately after shifting, nor until the roots have struck into the fresh soil; and it is advisable to manage so that the plants may make a moderate growth in autumn, after the last stopping. The atmosphere should be cool and rather dry after the middle of September, and by the end of the month the plants should be removed to their winter quarters, for which purpose a front shelf in the greenhouse will be found the best. During winter water must be applied carefully, and rather sparingly, for if given in excess at this season the plants will be ruined. As early in spring as may be convenient remove them to a situation where they can be afforded a temperature of about 50° , with a moist growing atmosphere, and as

much light as possible. If the pots are full of roots, shift at once, and, as soon as the plants seem to have taken to the fresh pot, stop them, and regulate the shoots. In May, or as soon as mild warm weather has set in, remove them to a cold frame, and treat them during the summer as recommended for last season—giving a second shift as early as it may be required; but a large shift should not be given at this season. They should be wintered as recommended last year, and if they are considered large enough for blooming, they should be allowed to remain in the greenhouse until the blossoms expand; while in the bloom they may be placed in any airy cool situation, and if screened from the mid-day sun the colour will stand longer. If large handsome specimens are desired, it will probably be necessary to grow them another season, and in that case the plants must be placed in a growing temperature early in spring, and stopped and potted as recommended for other seasons. Well-established specimens may be kept in the greenhouse after flowering, to make wood, and may be removed to the plant ground in autumn; but a sheltered situation should be afforded them, and they must be removed to the greenhouse as soon as heavy rains shall have set in, especially if they have been fresh potted during the season. Good rich turfy peat is the only suitable soil for this genus, and as the best pieces only should be used, break it up into nice small bits, and mix it liberally with sharp silver-sand and broken potsherds, or small bits of charcoal. In potting, make the fresh soil rather firm about the old balls.

REMINDERS FOR GARDEN WORK IN JUNE.



INKS, CARNATIONS, and PICOTEEs.—Having reduced the stems to one, and the buds on that stem to two or three, the forwardest must be tied round the middle; to prevent it from bursting, worsted or bast matting will do to tie with; some use strips of parchment or goldbeater's skin, and gum them round the bud, which is a bad plan; worsted will stretch a little, so that though restrained, the bud is not damaged, and bast matting is tied with only the single knot, so that even that would give enough to prevent damage. Cards are then to be placed under the flower to hold up the guard petals, which should be laid down as they develop themselves, and form a circular outline as near as may be; the easiest mode of putting on the card is to make a circular mark in the middle of it, as large as a sixpence, and cut across it five times; by pressing the little finger upon it, the card gives way, and a round hole is formed, the angular points forming so many springs to hold the end in its place; the card is passed on by cutting it from the edge to the hole in the centre. The first row of large petals having been laid down, the next sized petals should be brought down also as they bloom, laying one over each pair of the guard petals; so on with a third row if there be one, and cover the pairs of the second; the others must form a crown or high centre, and any that happen to be ragged or self-coloured, or in the way, must be pulled out. They must have no sun nor rain to wet the flowers when they once open; oiled paper caps held above the flower with a stick are mostly used. When the first flowers are perfect, the work of propagation must be done by piping, that is, the sprigs round the bottom of the stem are taken off two inches long, the lower leaves stripped off, and planted in rich earth, watered till it is like mud, hand-glasses covered over them, and shaded from the mid-day sun.

ROSES.—Bud as soon as the stocks have grown enough to offer an opportunity; their bark should readily peel off. Take a bud from a rose you wish to

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propagate, cut it off with its leaf, and half an inch of the bark, turn up the bark then, and take out the little wood that is under it; then cut a slit an inch long down the branch which is to receive the bud, and cut it across in the middle, thus forming a cross. With the handle of a budding-knife, or a sharp piece of wood, raise up the bark on both sides, tuck in the bark of the bud under each side of the bark raised in the stock, fit the leaf and its bud exactly at the cross point, tie the bark of the stock down with worsted yarn or bast matting, cover it with loose damp moss for a few days, and the union will be complete; then cut away all the useless portions of the stock. China rose cuttings may also be struck under a hand-glass.

CUTTINGS of fuchsias, geraniums, heliotropes, and all sorts of greenhouse plants may be struck, and struck cuttings may be potted off into small pots.

RANUNCULUSES and ANEMONES of the autumn planting and spring blooming may be taken up and stored as soon as their foliage decays.

DAHLIAS must be fastened to their stakes as they progress in their growth.

APHIDES, which infest roses, carnations, dahlias, and others, should be syringed off with clean water in the evening, after sunset, or morning before the sun is upon them.

WATERING is now becoming a very necessary operation for all plants in pots, and those which stand out of doors should be often turned round to prevent them from rooting through.

WEEDS which grow rapidly must be kept under by hoeing, pulling, and digging out with the spade.

DECAYED FLOWERS and SEED-VESSELS, except where seed is wanted, should be taken off every kind of plant. It gives life and vigour to latent blooms and prolongs the flowering.

VINES and WALL-FRUIT.—The former must be constantly attended to, all shoots which are not required must be taken off; wall-fruit of all kinds should be cleansed of the fly, grub, snails, slugs, and other vermin. The syringe is the most powerful antidote if frequently applied with clean water, or if that be not sufficiently efficacious, first with tobacco-water and then clean; all foreign shoots, that is, those which stand out from the wall, must be taken off.

TURNIPS.—Sow for a principal crop, roll them in, and if there be no rain for a considerable time, water them.

SCARLET BEANS.—Sow if not done already, and earth those already up and advancing.

SALADS.—Radish, Lettuce, etc., may be sown again.

PEAS.—Sow the early kinds, as they grow faster than the late ones, and are soon in flower.

BEANS will bear another crop, to be sown for those who like them.

Transplant, after a shower, or after well saturating the ground with watering, Borecole, Brussels sprouts, leeks, sprouting brocoli, and cabbage, in rows eighteen inches apart, and fifteen inches apart in the row; but the cabbage may be planted half the distance apart, so pull out every other one small for greens.

CELERY.—Plant out a few of the strongest plants for early use, in richly-manured ground well dug, and in a trench not more than six inches deep.

SPROUTING BROCOLI, CABBAGE, KIDNEY-BEANS, may be sown.

ONIONS.—Hoe and weed to thin and clean them.

CUCUMBERS.—Give air, and stop leading shoots.

TO CORRESPONDENTS.

CAMELLIA CUTTINGS.—*C. Draper*.—August is perhaps the best time for striking them. They should consist of well-ripened shoots of this year's wood, and should be struck in silver-sand. Place them at first in a cold frame for five or six weeks, and then start them on a gentle bottom heat.

STRAWBERRIES.—*P. O. S., Oswestry*.—Cutting off the runners as they appear neither does good nor harm, except that it will deprive you of young plants, should you require them. Plant out the plants forced last season, and obtain a fresh stock from runners for forcing. You will be more successful with the latter than with plants forced two seasons successively.



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SUMMER WILD FLOWERS.

(Continued from page 168.)



Y this time the furze and broom have had their share of our admiration, if they have had but little of our attention. They represent the great natural order of Papilionaceous plants, so named because of the resemblance of their flowers to butterflies. They are also called Fabaceous, because of the peculiar bean-like pod in which their seeds are produced, "*fabia*" being the Latin for a bean. The fabaceous plants rank second only to the grasses in value as ministrants to the economy of animal life, for they produce food for man and beast in vast abundance, and, generally speaking, the aliments derived from this family are of the highest character in point of nourishing power, all of them contributing largely to the nourishment, not only of the muscular and bony frame-work, but in a peculiar degree also to the nervous system, owing to their richness in nitrogen and salts of phosphorus. In a majority of cases the fabaceous or leguminous plants have pinnated leaves; that is to say, each separate leaf consists of a series of symmetrical divisions united by a common stem. In the laburnum, locust, and acacia trees, we find the leaves to be formed on the same plan as in the commonest vetch, for these are all members of the Leguminosæ; but in the vetch the pinnated leaf terminates in a tendril, whereas in all the trees of the family the leaves are destitute of tendrils. An interesting exception occurs in the case of the Judas tree, *Cercis siliquastrum*, which you may find in many a good garden; in this case the leaves are entire and orbicular; but the pretty pink flowers are as like those of a pea as are those of the Common Rest Harrow, *Ononis arvensis*, a pretty, low-growing, thorny shrub, with rosy-pink flowers, which you may now find on many heath lands and sandy waysides. The Common Broom, *Cytisus scoparius*, may be studied with advantage as a representative plant. The leaves are in threes, and remotely resemble those of the clover, which also belongs to this family. The flowers are formed, like those of the pea, with five petals, so disposed as to serve for the image of a butterfly. The uppermost constitutes what is called the vexillum or banner, those on each side are the wings, and the lowermost pair the keel. The petals must be stripped off for the full display of the stamens and pistil, which will be found as represented in the figure, the filaments of the stamens being all united at the base. Fertilization is effected by insect agency, and probably in this way—a bee enters the flower in search of honey, and comes out well dusted with pollen. The stigma of the flower entered is perhaps not so ripe as the stamens in the same flower, and if the bee leaves a dust of pollen on it, no effect is produced; but the next flower the bee enters may be ready to receive the pollen, and whatever the bee leaves upon it in bustling in after honey takes effect, and immediately afterwards the pod begins to grow. In due time the bush is, by the aid of such agencies, covered with legumes of pods, bearing seeds upon the upper seam of the

valves destined to be scattered when ripe by the cracking of the dry legume in the heat of the sun. While yet in a fresh green state, the remains of the calyx may be found with the dry filaments of the stamens at the base, and the remains of the stigma at the point of the pod. The common garden pea carries the remains of the stigma at the point of the pod, like a chaffy scale, in just the same way.

An immense number of papilionaceous plants are now in flower; we must mention very few. The Common Furze, *Ulex Europæus*, you know; but perhaps you do not know the pretty little Dwarf Furze, *U. nanus*, a very spiny small edition of it, which, from the end of this month until Christmas, will light up many of our heaths and moors with its brilliant yellow flowers. "Not know it!" you exclaim, in astonishment. Well, perhaps you do not know it as distinct from the whin of the hedgerow and the sandy waste. Now, here is one character by which to distinguish this plant from the Common Furze—the flower-stalks are accompanied with bracts wider than themselves; in the Dwarf Furze the bracts are the same width as the flower-stalks; moreover, the Dwarf Furze is hairy, the spines and stems are hairy; but in the other, smooth. A pretty broom to look for now on mossy lands is the Needle Greenweed, or Petty Whin, *Genista anglica*, a very spiny, wiry plant, with pretty tufts of small yellow flowers, which crown it as with golden garlands. The Medick, or Lucerne, *Medicago sativa*, you may find upon the farm lands, if it does not occur in your rambles far a-field. Its purple flowers cause a great mass of it to present a beautiful feature in the landscape, especially when it occurs in the same scene with acres of yellow mustard and crimson clover. The Yellow Melilot, which is far from common, though by no means scarce in many parts of Cambridgeshire, is well worth hunting for, as, indeed, it is well worth growing in the garden. The spike of flowers may be likened to a brush or comb, as they all turn one way, and form a close fringe of delicate yellow tubes, in which the characteristic features of papilionaceous flowers may be easily traced out. It is to this plant, in part, at least, that Gruyere cheese is indebted for its peculiar flavour, the Melilot being abundant in the pasture of Gruyere.

One of the most interesting trefoils is the Hare's-foot, *Trifolium arvense*, with heads like velvet; the colour of the flowers pale pink, peeping prettily out of a soft grey down. It loves the neighbourhood of the sea, and you may make sure of finding it on the pastures of Kent, especially near Sandgate. A very pretty kind is the Soft-knotted Trefoil, *T. striatum*, with distinct, small rounded leaves, and downy heads of reddish-purple flowers. The Strawberry-headed Trefoil, *T. fragiferum*, is really like a strawberry, the head rounded, and consisting of little purplish-red flowers, set amongst conspicuous green calyces. Look for it in the salt marshes of Kent and Essex. Salt marshes are capital hunting-grounds, where you may have to hunt oxen as well as flowers, or perhaps the oxen, if you are a trifle too timid, will hunt you. The Lesser Yellow Trefoil, *T. minus*, is an annual plant, quite common in good pastures. It has pretty little heads of yellow flowers.

From the trefoils proper we pass to the Bird's-foot Trefoil, *Lotus corniculatus*, with flowers most distinctly papilionaceous, and remotely resembling those of the laburnum; the seed-pods being long and narrow, and in groups of threes, like the foot of a bird. It is well known in gardens, and one of the best of rockery plants. Next the vetches, and trouble enough they will give you. The Sweet-milk Vetch, *Astragalus glycyphyllos*, is a bold and handsome plant, with larger leaves than we generally meet with amongst the herbaceous members of the pea-tribe. The plant is sometimes mistaken for a young Robina, but it may be distinguished from anything of the kind by its prostrate stem and large dull yellow flowers. The loveliest of the vetches is the Wood Vetch, *Vicia sylvatica*, which adorns the hedgerows in mountainous woody districts all the summer long, with garlands of blush flowers of the most elegant character. More common, indeed, most common, is the splendid Tufted Vetch, *V. cracca*, which loves to climb through the tangled rough herbage of the hedge, to toss out its showy tufts of purplish-blue flowers at the very summit, and mixes in the midst of brambles and rest-harrows on the plain, to adorn them all with flowers that seem to belong to them, but which, we need not be told, are not theirs. In the north, the Bitter Wood Vetch, *V. orobus*, with cream-coloured flowers, takes its place, and grows in the same way. The Common Vetch or Tare, *V. sativa*, may be seen more often on the farm and in the market-cart than as a wildling; and for that very reason, perhaps, on the principle that familiarity breeds contempt, it is one of the last of our native plants with which a field botanist makes a thorough acquaintance. Equally valuable is the Bush Vetch, *V. sepium*; its dull blue or pink flowers are extremely common in hedgerows, and on the skirts of plantations. It forms a distinct dull green bush, with small clusters of flowers, which are followed by an immense number of pods. The leaflets are egg-shaped or elliptic, the pods smooth. It is the least attractive of all the vetches.

The most common of the wild peas is the Meadow Vetchling, *Lathyrus pratensis*, which has large yellow flowers borne on slender stems, high up amidst brake and bush, above which it climbs by the help of its tendrils. The Everlasting Pea, *L. latifolius*, is rarely met with now, and is probably not a native, though to be found in woods in Cumberland and Worcestershire. The reader does not need to be told that it is a favourite in the garden, and one of the most beautiful and various of hardy plants known. The Sea-side Pea, *L. maritimus*, is rare, and probably not a native. It is well worth finding, both for its beauty and the story of its appearing in great plenty in a season of dearth, and thus helping to mitigate the effects of a general scarcity. It has a very distinct leafage, and roundish heads of purple flowers. It may be found at several stations on the eastern coast of England, and usually on rocky sites far away from either mud or sand. Many more of this great family are flowering now, and scarcely one that is not worth a long journey to obtain it, and a little patience to determine its name and learn its fame.

Now for the grasses, which are everywhere flowering abundantly. They gleam in the meadow like silver feathers; they sparkle amid the herbage of tangled hollows with their whitish, yellowish, reddish, cloudy sprays of indeterminable beauty; they make the dusty highway cheerful with their humble imitations of oats, and rye, and barley, and they climb to the tops of the old walls, and to every lodge on the old tower, and make greybeards, and hoary seams, and strange scars and splashes on the masonry, to indicate that time despises architectural lines, and can deface them all by the aid of grains of dust that float on the air unseen. One little grass seed wafted to the top of the turret shall suffice, in the course of years, to clothe the whole of some vast ruin with a green tracery of loveliest vegetation, the roots of which shall eat into its very heart, and cause its ultimate return to the dust, out of which, as proud art directed, it originally sprung.

The grasses constitute a great natural order, which bears the collective designation *Graminaceæ*. This order includes all the grasses commonly recognized as such, together with all the grain-producing plants, such as wheat, rice, maize, millet, sugar-cane, etc. They all bear true flowers, which are destitute of proper corollas, and these flowers are succeeded by seeds, which more or less resemble barley, oats, or wheat, except it may be in size and colour, and these seeds usually contain a large amount of nourishing farina, which renders them valuable as food to man or to cattle, or to the little singing birds that trust themselves to God for all in all. In their roots they are not, generally speaking, peculiar, but in their stems and leaves they present unique characters. The stems are cylindrical (never triangular), usually hollow, always jointed, with a leaf at each joint, the leaf proceeding from a split sheath, at the summit of which there is attached a leafy appendage, called a ligule. The grasses grow from within, and belong therefore to the great department of the vegetable kingdom to which botanists apply the collective term "endogens," as distinct from exogens or outside growers, this last division comprehending the larger portion of all the flowering plants known, and of trees especially.

The principal associates of the grasses as endogens are palms, orchids, and lilies, all of which produce flowers, in most cases beautiful, but always in some respects different in plan from the flowers of exogens. We have now to do with the flowers of the grasses, the structure of which should be clearly understood by any one who entertains a hope of enjoying the pursuit of field botany. Putting aside exceptional cases it may be said that the flowers of grasses always contain stamens and pistils, or that the stamens are in one set of flowers and the pistils in another. A splendid example of the separation of the sexes occurs in the maize or Indian corn. The female flowers are produced at the joints on the incipient cobs, and the males in the form of a tuft of silken threads, or, indeed, more like spun glass at the top of the plant, "the plumes of Mondamin." The stamens and pistils are usually enclosed in chaffy husks or glumes, which constitute the most conspicuous feature of the inflorescence. These glumes or chaffy scales, of which every flower

(where glumes are present) has two, are usually dissimilar, and are called glumellas; on the outer one is produced the awn or bristle which characterizes the flowers of some of the grasses. Every separate group of flowers forms what is called a spikelet, and every aggregate of spikelets constitutes the spike or panicle.

There are forty-four genera of British grasses and about one hundred and twenty species. Very many are so nearly alike that no beginner could hope to distinguish them even were they to be met with in his earliest rambles, but the beginner may, nevertheless, find a great many and very quickly understand them sufficiently to hunger for knowledge of more.

The sweet-scented Vernal-grass, *Anthoxanthum odoratum*, is one of the most abundant and useful of the family, contributing largely both to the fragrance and nourishing properties of good hay. It flowers as early as April, and produces ripe seeds in June. It forms what may be called a quite common-looking panicle of a pale dingy-



PINE BENT GRASS.



SPREADING SILKY BENT GRASS.

green colour, from every flower of which two stamens protrude in a very characteristic manner. The Fox-tail grasses have close dense spikes, which may be likened to tails, though not of foxes. The commonest of them is the Meadow Fox-tail, *Alopecurus pratensis*, which may be found in almost every good pasture. The Canary grass, *Phalaris canariensis*, may often be found on rubbish heaps, whither it has been conveyed in the emptyings of a bird-cage. The panicle is large and almost globose, of a pale straw colour. The Reed Canary grass, *P. arundinacea*, produces a loose spike, and the plant is extremely robust, growing usually by the sides of rivers. The common variegated grass of our gardens, the "gardener's garters" or "ribbon grass," is a variety of this native water grass, and its flowers therefore may serve to aid in the identification of the species when met with. The Mat-weed or Sea Reed, *Ammophila arundinacea*, may be seen on the sea coast in great masses binding drifting sands, and thus preventing the dreadful injury they might inflict

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upon the inland countries when blown by storms towards the land. Its companions in this beneficent work are the Lyme grass, *Elymus arenarius*, a bold habited grass with broad, arching, glaucous leaves; and the Sea-sedge, *Carex arenaria*. The Cat's-tail grass, *Phleum pratense*, may be found in almost every meadow, and is one of the most valuable hay grasses, though coarse and little cared for by cattle when growing. It produces a long close spike, which sufficiently agrees with its name to aid in its identification. The Hare's-foot grass, *Lagurus ovatus*, is quite a beauty, and I present you with a miniature of the complete plant, as well as a figure of a flower-spike natural size. It is scarce, being usually only found as a British plant on sandy spots in Guernsey, but it is much grown in gardens, both to adorn the rockery while living, and to assist in the formation of winter bouquets when dried.

The Millet Grass, *Milium effusum*, is very distinct. If you can



TUFTED HAIR GRASS.



REED MEADOW GRASS.

imagine a ghostly bit of wire-work intended to represent a succession of umbrella-ribs, with one stem piercing the whole, you may, when you meet with it, be able to effect an identification. Wretched comparison—suffice that this is a daddy-longleg sort of a grass that I must not say another word about. The Feather Grass, *Stipa pennata*, you are not likely to find wild, but as you cannot do without its handsome feathery plume for winter bouquets, plant it in the garden, and thus enlarge your field. The Fine Bent grass, or Black Quintale (or Twitch), *Agrostis vulgaris*, bears most delicate, purplish spikelets on hair-like stems, that tremble to every passing breeze.

Another pretty thing is the Silky Bent, *A. spica-venti*, with loose light panicle of pink or pale green hue, shining like silk, and bending most elegantly to the passing breeze. It is plentiful in moist fat lands near London. The Tufted Hair-grass, *Aira caespitosa*, is another delicate beauty, commonly inhabiting ditches

and other like damp spots, and very plentiful near London. The flower-spikes may be likened to wire-work dotted with beads to form a loose pyramidal pattern. The purple Molinia, *Molinia cœrula*, merits notice as the darkest-coloured of all our grasses, the colour of the glumes being dark-green with reddened tinge of blue, and the large anthers are of a purple colour. In form it is poor, the spikelets being on a long, straight, wire-like stem, few and distant. The Soft Meadow grass, *Holcus lanatus*, may be found wherever a grass of any kind can live; and you may know it by its large and beautiful soft panicle of numerous small spikelets



PANICLE OF COMMON QUAKING GRASS (NATURAL SIZE.)

of a pinkish-purple colour, and its downy leaves. The flowering of this grass is in many districts the signal to begin hay-making.

The Reed Meadow grass, *Poa aquatica*, grows on the margin of almost every river in the land, and you must make acquaintance with it, or, as a botanist, be accounted "nowhere" in the grasses. It bears a noble plume above its broad bright-green leaves, and makes a bonnie show in the shallows, when in flower. As for the other poas, fifteen in number, we had best slide past all save one, and that one, the Rough Meadow grass, *Poa trivialis*, is one of the very best for garden lawns in the vicinity of towns, and there-

fore well worth knowing. It is of slender make, with roughish stem, the panicle green, much branched, the stems of the spikelets long and wiry, the leaves taper pointed.

There are three species (so-called) of Quaking grass, and they are, perhaps, the loveliest of all the grasses that find their way into the garden. The Great Quaking grass, *Briza maxima*, is nothing other than a robust form of the common Quaking grass, *Briza media*, and this being the queen of British grasses, we present a portrait of her face, life-size. The Cocksfoot grass, *Dactylis glomerata*, you will soon learn to distinguish as a wild plant, by observation of the low, tufted, broad-leaved, variegated grass of the same name grown in gardens.

The Crested Dogstail, *Cynosurus cristatus*, is peculiarly distinct, with rigid, hard-looking spike of a lilac hue. It grows everywhere, and is everywhere welcome for the valuable herbage it affords.

Sheep's Fescue, *Festuca ovina*, is a peculiarly fine-leaved grass



COMMON QUAKING GRASS.

growing in tufts on sandy soils, where it constitutes a most elegant rich green herbage. The panicles are unattractive. It varies much in character in different localities, and a blue-leaved variety is grown in gardens. In Greenwich Park three or four varieties may be found, one of them having leaves as fine as hairs. On heath lands a viviparous form of this grass may often be met with. This variety does not produce flowers. Everywhere, by the sides of dusty roads, and on old brick walls and chimney-stacks, a rather ugly, short, sturdy, barley-like grass will be found, but scarcely ever does the vagrant trespass on the meadows. It is the Wall Barley, or Way Bennet, *Hordeum murinum*. This is the grass that children put up their sleeves to vary the monotony of school-work.

Finally, to dispose of the grasses, mention must be made of the Darnel, *Lolium temulentum*, which is by no means common, though plentiful in some localities. The leaves are flat and rough on the upper side. The stem rises two or three feet high, bearing two

rows of small spikelets, each containing about six flowers bearing hair-like awns. The plant attains a great size, and when growing amongst corn may be readily distinguished from other grasses. It has quite a literary fame as the "only poisonous grass," but in truth it is no more poisonous than a mushroom, which most of us are prepared to eat at any time without the shadow of a fear.



SHEEP'S FESCUE, VIVIPAROUS FORM.

The garden is capable of affording immense aid in the study of the grasses, and the collections which are grown as ornamental plants comprise a number of British species which, as a rule, are scarce as wild plants. They are valuable, too, for winter bouquets, and far more pretty in their natural colours than dyed, as we see them in the shops. As for variety, it is truly wonderful that so simple a type should be capable of the variations which we find in

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this great family. What a contrast, for example, does the little quaking grass afford to the great silvery plumes of the American Pampas grass, *Gynerium argenteum*, which adorns our gardens with its fountain-like herbage and gleaming silvery feathers.

SALVIA SPLENDENS.



HERE winter-flowering plants are largely in demand for the decoration of the conservatory, or for supplying cut flowers, this will be found exceedingly useful; for nice-sized specimens are easily grown in the course of the summer; they require very little attention or accommodation, and when seen in the form of large specimens, well covered with spikes of bright scarlet flowers, few winter blooming plants present a more brilliant appearance, and scarcely any remain so long in beauty. Being a very rapid grower, it is unnecessary to keep old plants after flowering, except one or two to supply cuttings, for young plants occupy much less space in spring, and form large specimens in course of one summer. Cuttings should be put in not later than the middle of March, and afforded a gentle bottom-heat until they emit roots, when they should be potted singly in pots. After potting, place them in a close, but not over-warm situation, and as soon as they get established keep them under a glass, and afford them all the light possible, syringing overhead morning and evening in bright weather, and keeping the atmosphere as moist as circumstances will admit. If good-sized specimens are wished by the autumn, the young plants should not be allowed to suffer for want of pot-room, but should be shifted as soon as the roots require more space; and unless this be attended to it will be difficult, or nearly impossible, to keep them dwarf and well furnished; and if the plants are allowed to get into a pot-bound, starved condition, their great enemy—red spider—will also be sure to attack them. For soil, use equal parts turfy loam, leaf-soil, and thoroughly decomposed cow-dung, with a liberal admixture of sharp sand for first potting, and a small proportion, with plenty of lumpy bits of charcoal, for the after shifts. This compost will rather incline to be close; therefore, efficient drainage must be secured, and care must be exercised in watering not to get the soil sodden before the pots get filled with roots. As to the plants in growth, the shoots should be stopped and tied out, in order to secure bushy compact specimens; but if a vigorous root action is maintained, there will be little difficulty in keeping the plants bushy. A cold frame or pit will be the best situation for them after the beginning of May, or earlier if the weather proves favourable, but they should be kept close here, and not allowed to sustain any check, which at this stage would be very injurious. If all goes on well, the plants will be ready for shifting in good-sized pots by the end of June, and I seldom repot them after this season. By this time they should be strong and well established in eight-inch pots; and when this is the case I shift some into twelve, and others into fifteen-inch pots, according to the strength of the plants and the

size it may be desirable to have them by the flowering season. They should be returned to their former situations, kept close and moist, and encouraged to make active growth, merely giving sufficient air to keep the young wood strong. When the pots get well filled with roots, and the plants become good-sized specimens, which will be the case by August, they should be gradually prepared for removal to a sheltered situation out of doors, where they will be shaded from the forenoon sun. Here they will make short stocky growth, and will flower more profusely than if kept under glass all the autumn; but they must not be rashly exposed to the sun, to dry and discolour the foliage. As to stopping, this should not be practised on plants intended to flower in November later than about the middle of August, and all the strong shoots should be stopped, otherwise the specimens will flower irregularly. If it should be desired, however, to retard the blooming of a portion of the plants, they may be stopped as late as October; but in this case it will be necessary to afford them a close place under glass until they make flowering wood. As soon as the weather becomes unsettled in autumn, the plants must be placed under glass, for they are very easily injured by frost, and should be afforded a light airy situation. But if it should be desirable to have them in flower at once, they may be kept close and moist, and in this case they will soon be covered with their spikes of brilliant scarlet. If afforded a situation free from damp, and near the glass, with a temperature of about 45°, they will remain long in full beauty; but large potbound specimens should be liberally supplied with manure water.

After flowering, the specimens may be thrown to the rubbish heap, reserving one or two to supply cuttings. These should be kept dry at the roots for a fortnight; then cut back rather closely, and placed in any spare corner of the greenhouse until towards the end of February, when they should be placed in a warm house, and thoroughly watered, when they will soon furnish a supply of cuttings.

AOTUS GRACILLIMA.



THIS slender-growing, graceful-looking plant is well worthy of more attention than it generally receives, for when well grown it is very ornamental. It is readily propagated by means of cuttings of strong, short-jointed, young shoots, which root very freely, if selected when about half ripe. But the propagation of such plants as this had better be left to those who have proper convenience for doing it well, for amateurs generally fail in producing good young plants; and leggy, ill-propagated examples of any of the species of this genus are not worth house-room. Beginners procuring young plants from the nursery should be very careful to select healthy, strong, bushy ones. If obtained at once, place them in a cold frame, where they can be kept cool and moist, and shaded from the mid-day sun. If they appear to require more pot room, examine the state of the

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roots, and give a moderate shift if necessary; but unless the ball is found to be well-filled with healthy roots, defer shifting until this is the case; for there is considerable risk and no advantage in overpotting such plants as this. It is desirable, however, to get such things into the pots in which they are to be wintered as soon after this season as possible, so as to allow of having them well established before winter; therefore shifting should be attended to as soon as the plants require it.

Keep rather close and moist for a fortnight or so, after repotting, giving water very carefully; but sprinkle the plants overhead morning and evening, and keep the atmosphere as moist as can conveniently be done to prevent rapid evaporation until the roots get hold of the fresh scil. During the growing season, attend to keeping the shoots nicely pegged down or tied out, in order to admit light and air, and to secure strong growth. After the middle of August discontinue syringing and shading, and expose the plants freely to sun and air; and, when it can be done without danger of frost or heavy rain, leave the lights off at night, and endeavour to have the wood strong and well matured previous to winter.

When cold or foggy weather sets in, it will be advisable to remove the plants to their winter quarters, which should be near the glass in the greenhouse, where they may receive all the light possible, and a free circulation of air whenever the weather will permit; for growth must not be encouraged at this season. Give water very sparingly to the soil, and if the house is properly managed, it will be necessary only at considerable intervals; and when any is given, the ball should be thoroughly moistened. Towards the middle of March, cut the shoots back as much as may be necessary to induce the buds to break closely, and place them in the closest part of the house, keeping them well supplied with water at the roots, and a slight sprinkle with the syringe on the morning of bright days will be useful. As soon as the buds have fairly started, shift into pots two sizes larger than those in which the plants have been wintered, and place them where the night temperature may range from 40° to 45° , allowing it to rise some 10° with sunshine and air. Keep a watchful eye, however, upon the young specimens, and endeavour to secure well placed strong growth, regulating the temperature, etc., more by the state of the plants than by any preconceived notion, or arbitrary rule; and if insects are perceived they must be eradicated at once. Owing to the difficulty of maintaining, in large houses, a cool, moist atmosphere, without which these plants can hardly be induced to make strong rapid growth, they should be removed to a cold pit or frame as early in spring as the weather proves at all settled. Afford them plenty of pot-room during the growing season, as much warmth and moisture as they will bear without making weakly growth, exposing them to all but the mid-day sun, and keeping the shoots carefully tied out, and if all goes on well they form nice compact little specimens by winter, and will bloom profusely the following spring.

They should be wintered as recommended above, and of course they should be allowed to remain in the greenhouse to bloom, and

the flowers should be carefully shaded from bright sunshine as their beauty soon fades unless this is attended to. After flowering, the shoots must be cut back, the plants repotted, etc., as already recommended, taking care, however, not to over-pot, and, with careful attention, large handsome specimens will be obtained in the course of a few years. The only suitable soil for this genus is good, light, rich turfy peat, which should be broken up rather fine, and well intermixed with about one-fourth its bulk of clean silver-sand, and a small portion of lumpy bits of charcoal.

BEGONIA FUCHSIOIDES.



AMONG many favourites of our plant-houses, few are more deserving of attention than the Fuchsia-like Begonia. Its graceful habit, the brilliant colour of the flowers, the short time required to have plants in a blooming state, render it worthy of universal cultivation. To those with whom winter-flowering plants are in demand, this Begonia will be found indispensable, and when well-grown and bloomed, it cannot fail to be generally admired.

I aim at having the plant in flower the whole, or, at least, the greater part of the year; and to secure this, it is necessary to propagate at two different seasons. In the first instance, cuttings are obtained in the beginning of February, selecting healthy pieces, such as are not over full of sap, and which are rather firm; these strike freely, inserted rather thickly around the sides of five-inch pots, and plunged in a close, warm frame, where the bottom-heat is about 75° or 80°. Any light sandy soil will answer. I generally use equal parts of silver-sand and leaf-mould, the latter passed through a fine sieve, and thoroughly mixed with the sand. When the cuttings are well rooted, which will be the case in the course of a month, they should be potted singly in five-inch pots, and replaced in the propagating frame, and if they can have the assistance of a gentle bottom heat all the better. When the pots become filled with roots, shift into eight-inch ones, and place the plants in a shady corner of the stove, or wherever it may be convenient, provided a temperature of from 60° to 65° is maintained, and a moist atmosphere is kept up; but unless they occupy a shady situation, it will be necessary to screen them from the mid-day sun, as this species is rather impatient of bright sunshine; and if thus exposed, it loses that fine, glossy appearance which the foliage presents when in vigorous health.

When pots become filled with roots, a little clear manure water will be beneficial, and they should be syringed with pure water, morning and evening. By the middle of June they will require a final shift into thirteen-inch pots, and should be encouraged to make vigorous growth. With regard to stopping, they merely require to have any over-luxuriant shoot stopped when it has attained the

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desired height, so as to regulate the flow of the sap, and induce the formation of lateral branches, upon which the flowers are produced. The stronger shoots should be supported by neat stakes, and tied out, so as to accommodate the side shoots which are to produce the flowers.

Managed in this way they form fine bushy plants, commence blooming in October, and continue in flower till March, or even later, if kept in a temperature of 50° or 55° . A second lot of cuttings should be got in about the beginning of July, and treated as the first, except that after the second shift, which they should receive in September, they may remain in eight-inch pots till February. During winter they should occupy a situation near the glass, where the temperature may average from 50° to 60° . Early in February a portion of the plants may be shifted into thirteen-inch pots, after which a slight increase of heat will be essential to their well doing; but when subjected to a high temperature at this early season, they should receive all the light that it is possible to give them. As the plants progress in growth, they must receive attention in the way of stopping and tying, and when the pots become full of roots they should be watered frequently with clear manure.

The remainder of the plants, if allowed to remain in their winter pots, and encouraged with a slight increase of temperature, will flower at an earlier period than those which occupy larger pots, or they may be left in a cool place until the middle of March, and then shifted to form a succession to those shifted in February. This *Begonia* may be removed to a conservatory when in flower, where it will continue to produce a constant succession of blossoms during several months; but unless the conservatory is treated something like an intermediate house, it will be necessary to place the plants in the warmest corner, and where they will not be exposed to currents of cold air; a situation where they can receive abundance of light, without being exposed to the direct rays of the mid-day sun, will be necessary in order to have the flowers well coloured. After the blooming season is over, the old specimens may be thrown away, to afford space for young plants, which bloom more freely and produce fine trusses.

The soil best suited for this *Begonia* in all its stages is equal parts turfy loam, peat, and well decomposed cow or horse manure. The peat and loam should be carefully broken, and used in as rough a state as the size of the shift will allow; the dung should be carefully mixed with sharp sand previous to being mixed with the peat and loam; this tends to thoroughly separate any lumps, which otherwise would be sure to form a harbour for worms; the quantity of sand should be regulated according to the nature of the loam and peat, enough being added to secure perfect drainage, as this *Begonia* is somewhat impatient of stagnant moisture about the roots.

THE CINERARIA.



FLOWERING from Christmas to June, and forming handsome specimens for decorative purposes at a comparatively small expense, both as regards attention and accommodation, and also furnishing a profusion of finely-shaped many-coloured flowers for bouquets (which the *Cineraria* does), it well deserves to be, as it is, one of the most popular flowers of the day. It is of easy culture, and in most cases is well managed; but, nevertheless, in some instances (where ample means exist, and also, doubtless, a desire to produce respectable specimens), it exhibits effects of the worst possible treatment. The following hints may enable such growers to produce creditable examples of this extremely useful plant.

The ordinary method of propagating the *Cineraria* is by root suckers, which are produced abundantly by plants after blooming, when placed in a shady situation, and properly attended to with water. The old plants should be broken up as early in August as suckers can be had strong enough; the latter should be potted singly in four-inch pots, and placed in a shady part of a cold frame till well established, which will be in less than a fortnight. The plants should then be placed near the glass, and receive abundance of air, with a view to secure "stocky" growth. During autumn, and until severe weather occurs, a cold frame will form the most suitable situation for promoting rapid growth; but some attention will be necessary not to wet the foliage any more than can be helped, and also to avoid cold currents of air, which turn the leaves foxy, and greatly injure the plants. At the same time, however, admit sufficient air to prevent weakly growth. Water should be applied early in the day, when necessary, giving a good soaking, and air admitted on the sheltered side of the frame, to dry the atmosphere and foliage. During autumn and winter the *Cineraria* is somewhat liable to mildew, especially some varieties; keep, therefore, a sharp out-look for this enemy, and apply sulphur the moment it appears to the parts affected. Mildew is greatly encouraged by a confined, over-moist atmosphere, which is also very congenial to aphides, which will be sure to make their appearance under such circumstances. As soon as they are perceived, apply tobacco smoke; but if the plants are kept in good health, neither evil will be very troublesome. As soon as frost is likely to occur, the glass should be protected every night with straw screens, or some efficient covering; for, remember, the *Cineraria* will not stand much frost, and neglect in covering may do irreparable damage. With respect to potting, the plants should be allowed plenty of root room until near the period of flowering, and they ought never to be pot-bound during the growing season. Liberal shifts may be given to healthy, thriving plants, but weak varieties should not be over-potted. Specimens may have ten-inch pots at the second shift, which will be sufficiently large for the winter, and in March they may be moved into twelve or fifteen-inch pots, according to the sized specimens

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desired. The plants should be removed to the front of the greenhouse, or to some light, airy situation, where they will be secure from frost and damp. As before stated, keep them free from insects and mildew, and remove any decaying leaves as they appear. When the flower-stems begin to elongate, they should be pegged or tied out, so as to keep the specimens open for the admission of light and air; and manure water will be highly beneficial at this stage. When the plants are in flower, they should occupy an airy place, where they will receive abundance of light without being exposed to the full force of the forenoon's sun; but this applies only to plants flowering after the sun becomes powerful in spring. Those blooming in winter like full exposure to the little sunshine and light which can then be afforded them. Where specimens are wished to flower in winter, cuttings should be selected about April, planted in light sandy soil, placed in a temperature of about 55° , and grown as freely as possible during the summer and autumn, and allowed to become pot-bound towards November, when, if placed in a temperature of 50° , they will be found to flower freely, and will be exceedingly useful for furnishing cut flowers. Seeds sown in April produce useful plants for winter-flowering, as they grow more vigorously during the summer. When the beauty of the specimens is over, remove the flower stems, unless seed is wanted, and then only a few spikes need be left. Place the plants in a shady situation, and keep them clear of insects and properly supplied with water until a supply of suckers is obtained, when the old plants may be thrown away. Good fresh turfy loam, in the proportion of two parts to one of two-years-old cowdung, well intermixed with a quantity of clean, sharp sand, according to the nature of the loam, to insure sufficient drainage, forms an excellent compost for the *Cineraria*. For small plants, leaf-soil or sandy peat may be substituted for the cowdung.

CULTURE OF THE PELARGONIUM.

BY A CONTRIBUTOR.



PELARGONIUMS, even in good establishments in different parts of the country, are often very indifferently managed; and as the following is a method by which first-rate specimens may be produced, I have ventured to furnish it. I prepare the soil of an open border about the middle of July (this year I shall be a little later) and plant my cuttings. The situation chosen is exposed to the sun during the middle of the day. In about six weeks, the cuttings will be sufficiently rooted to remove, and I put them in three-inch pots. To prevent the worms getting into the pots, they are placed on a temporary stage, and allowed to remain in a shady situation about three weeks, by which time the plants will be well-established, and bear removing to a more exposed spot, where, under the influence

of the sun and air, the wood will attain a necessary degree of hardness. Here they remain until taken into the house for the winter, which is generally done about the end of September; the time varies according to season, but they are housed before danger arises from frost. To improve the appearance of the plants, and make them compact and bushy, I stop them at the third or fourth joint, and shift them into five-inch pots, using a little turfy loam and sand with the compost, to allow the water to pass freely through the soil. I give but little air during eight or ten days; the plants will then be re-established, and afterwards as much air may be given as the state of the atmosphere will permit until the beginning of December. The side-lights must be kept closed during the prevalence of cold winds. The pots by this time will be well filled with roots, and the plants will require shifting into eight-inch pots. The bone-dust which is now added must be used with caution; being of a drying nature it is not used near the surface of the soil. The shoots are again stopped at the third joint, the house is kept at a temperature of 45° Fahrenheit for about ten days, and then allowed to fall to 40° or 42°, at which it is kept. The flues are damped two or three times every night, to prevent the air from becoming too dry, and a little top air is admitted whenever the weather is sufficiently favourable.

About the middle of February, those plants which are intended to be large specimen plants are shifted again into nine-inch pots, those of vigorous growth will require a size larger.

A small stick is now put to each stem to train them into uniform and well-shaped plants. In the beginning of April, when fires are discontinued, the plants are syringed over the top three times a week; this is done about four o'clock, at the time the house is closed, and continued during three or four weeks. The house is well damped every evening, and the bottom and the top sashes opened the first thing in the morning, to allow the damp air to escape, and during the day all the air is admitted that can be given with safety.

The plants when beginning to bloom are freely watered, and protected from scorching rays of the sun during the middle of the day by means of canvas; and are thus retained in blossom a much longer time than would be possible if this precaution were omitted. When the plants are housed, the decayed leaves are removed; and whenever the green-fly makes its appearance, the house is well fumigated; to do this effectually, it must be performed when the plants are in a dry state, and they must be well watered the day following. When the flowering is over, the plants are exposed for about a fortnight to the sun and air to harden the wood before being cut down. Those plants which are intended as specimen plants the second season, after heading down, are placed in a sheltered situation where little water is given, and as soon as the new shoots are an inch long, are repotted into pots from one to two sizes smaller; the old soil is shaken from the roots and good drainage given. The plants thus treated are kept in better health during the winter, from having less soil about the roots. When repotted, they are placed

upon a stage in a shady situation, removed into the house at the proper time, and undergo the same treatment the second winter as described for the first. When those plants which are intended for specimens begin to show their bloom, they receive additional attention; a little liquid manure is occasionally given, they are no longer syringed over the top; bees are kept out of the house by means of gauze blinds, and every precaution is taken to preserve their beauty; they are never allowed to flag from exposure to the sun, or want of water. I recommend every grower to begin early to train his plants for specimens; when the shoots are young and tractable, any direction may be given to the stems; a uniform and handsome appearance will arise from the practice, and the plants will require fewer supports and less pulling about; at the time they receive their final dressing the flowers should be so arranged as to present an equal distribution of bloom over the head of the plant, to effect which the stems must be secured to small willow twigs. Practice alone can teach the art of dispersing flowers properly; the less art is employed, the better, and the means should always be kept out of sight.

The compost I use for my pelargoniums is the following: Two barrowfuls of good maiden loam with the turf, one ditto well-rotted cow-dung, three years old; this requires to be frequently turned over in winter, to destroy the worms and insects; one peck of silver sand, one ditto of bone-dust. For the winter repotting, a little more sand is added.

KALOSANTHES COCCINEA.



THIS and other varieties of *Kalosanthès* as bedding plants cannot be excelled either in beauty or the facility with which their cuttings are struck and brought into a flowering state. The immense and singularly compact heads of bloom that can be obtained from each comparatively small plant, in about nine months from the time the cuttings are put in, combined with their charming colour, render them among the most attractive plants in the parterre. Any time about the end of September I take some strong healthy points of the growing shoots, and after forming them into cuttings $2\frac{1}{2}$ inches in length, cutting close to a joint, and stripping the leaves from the bottom for about three-fourths of an inch, I lay them on the potting bench to dry for twenty-four hours. This is necessary, as from the extreme succulence of the plants, they are apt to rot if put in at once. Shallow pans or boxes, four inches deep, and any convenient length and width, are prepared for putting in two inches of drainage, then a little moss or sphagnum, and over that some lumpy peat or loam, an inch deep; and then an inch of sandy loam, fine lime rubbish and sand, well mixed, and pressed closely down.

The cuttings should be put in about an inch, or an inch and

a-half apart, and a slight watering given to settle the soil around them. Place them in any frame or pit, or even in a greenhouse, close to the glass, and they will strike freely, and continue rooting all the winter.

The tops will not grow much if kept near the glass, and plenty of air allowed them; nor is this desirable, as the dwarfer the plants are, the more novel and beautiful they look. In March prepare some compost for potting them, by mixing three parts sandy loam, some fine lime rubbish, a very little leaf-mould, or lumpy peat and sand. Take the plants from the pans with little balls of soil, by raising them gently with the potting stick, and place them singly in four-inch pots, well drained. Set them in a frame or pit, with their tops only four or six inches from the glass, and where the frost can be excluded, keeping the frame close for about a week or ten days, after which they must be gradually inured to a circulation of air. Tilting the sashes at the sides, by placing the tilter between them and the rafter, will be found to answer better than sliding, or only tilting at the back. The object is to give strength without drawing the plants up, and, by keeping the glass close to their tops, to cause them to set flower-buds, which they will readily do under such treatment; and by planting out in time, which with me is about the beginning of June, every plant, if well managed, will have its head of bloom perfectly formed, and beginning to expand.

Kalosanthes look best planted in circular or oval beds, placing the tallest in the centre, and gradually descending to the edge; the last row should be placed in the ground a little deeper than the rest, and should slightly incline outward, in order to give a rounded appearance. Any good border soil seems to suit them, but if poor, some fresh loam and leaf soil should be added. I always water the plants well before turning them out of the pots, and the bed also when necessary. Some green moss laid upon the surface of the bed gives it a neat appearance, and prevents evaporation.

ON THE PROPAGATION OF ORCHIDS.



HERE are different modes of propagating the various kinds of Orchids. Some are easily increased by dividing them into pieces, or by cutting the old pseudo-bulbs from the plants, after the latter have done blooming. Such plants as *Dendrobiums* are increased in this way. The best time for dividing the plants is just as they begin to grow, or when they are at rest. They should be cut through with a sharp knife between the pseudo-buds, being careful not to harm the roots. Each piece should have some roots attached to it. After they are cut through they should be parted, potted, and put in some shady part of the house, without receiving much water at the roots till they have begun to grow and make fresh ones; then they may have a good supply. *Dendrobium nobile*, *Pierardi*, *pulchellum*, *macrophyllum*, *Devonianum*, and similar

July.

growing sorts, are easily propagated. This is effected by bending the old pseudo-bulbs round the basket or pots in which they are growing, or by cutting the old flowering bulbs away from the plant, and laying them on some damp moss in a shady and warm part of the house, with a good supply of moisture. After they break and make roots, they may be potted, or put in baskets. Such as *D. Jenkinsii*, *D. aggregatum*, *D. formosum*, *D. speciosum*, *D. densiflorum*, and similar growing sorts, are increased by dividing the plants. *Aerides*, *Vandas*, *Angræcums*, *Saccolabiums*, *Camarotis*, *Renantheras*, and similar growing sorts, are all propagated by cutting the tops off the plants just below the first root, or by taking the young growths from the bottom of the plants. After they have formed roots, they should be cut off with a sharp knife, and afterwards put on blocks or in baskets, with some sphagnum, and kept in a warm and damp part of the house, without receiving much water, till they have begun to grow, when they may have a good supply. *Odontoglossums*, *Oncidiums*, *Zygopetalums*, *Sobralias*, *Trichopilias*, *Stanhopeas*, *Schomburghias*, *Persisterias*, *Mormodes*, *Miltonias*, *Lycastes*, *Leptotes*, *Lælias*, *Galeandras*, *Epidendrums*, *Cyrtopodiums*, *Cyrtochilums*, *Cymbidiums*, *Cyanoches*, *Coryanthes*, *Cælogyne*, *Cattleyas*, *Calanthes*, *Brassias*, *Bletias*, *Barkerias*, *Aspasias*, are all propagated by dividing them into pieces, each having a portion of the roots attached to it, and a young bulb on the pseudo-bulb. *Phaius albus* is very easily increased. The best way is to cut the old pseudo-bulbs off after the young ones have begun to flower—that is, just before the plant has made its growth. The pseudo-bulbs should be cut into pieces about six inches long, and then put into a pot in some silver sand, with a bell-glass over them, till they have struck root. They should then be potted in some fibrous peat, and should have good drainage, and a good supply of water in the growing season. Some of the *Epidendrums* readily propagate, such as *cinnabarinum* and *crassifolium*; these will form plants on the tops of the old flower-stalks. They should be left to grow till they have made their growth. They should then be cut off and potted, and they will soon make good plants. Some *Dendrobiums* will also form plants on the tops of the old pseudo-bulbs, and they should be treated in the same way.

ON THE MODE OF MAKING BASKETS, AND THE BEST WOOD FOR THAT PURPOSE.—Blocks or baskets are most suitable for true air plants, such as *Vandas*, *Saccolabiums*, *Aerides*, *Angræcums*, *Phalanopsis*, etc. When planted in baskets or on blocks, they send out their roots much stronger into the air, and suck up the moisture; whereas, if their roots are covered too much, they are very apt to rot.

Various materials are used for forming baskets. Some are made of copper wire, which is very durable; but I prefer those made of wood, though they do not last so long. They look better, and are more suitable for the roots of the plants to cling to. The best kind of wood is maple, or hazel, and the best baskets those of a square shape. The wood should be cut into lengths according to the size of baskets required; but do not make them too large. There are two objections to this—one is that they take up too

much space; the other, that the plants do not require much room. After the wood is cut into proper lengths, the pieces should be bored within one inch from the ends, taking care to have all the holes bored the same distance. There should be four lengths of copper wire—one for each corner. The wire should be put through each piece of wood, and brought up to form the handle, for suspending the plants from the roofing. Iron wire should never be used in making baskets, for it is probably injurious to the plants. The best kinds of wood for blocks are acacia, apple, pear, plum, or cork, if it can be obtained. The wood should be cut into lengths, according to the sizes required. Get some nails, and drive out at each end with some copper wire. To form the handle, wind the wire round each nail, and have the handle about ten inches high. Small copper nails are the best by which to fasten the plants on the blocks.

ALLAMANDA GRANDIFLORA.



WHEN well grown and flowered, this is one of the handsomest of the Allamandas, and it is not very difficult to manage. Let us begin with a young plant in a five-inch pot, brought in spring from the nursery. Such a plant, if in good health, will in general be found to be what is termed pot-bound.

The first operation, therefore, under such circumstances, will be to turn it out of the pot, remove the crocks, and carefully to disentangle the roots. If the latter are healthy, give rather a liberal shift—say into an eight-inch pot, using a mixture of one-half good fibry loam, one quarter peat, and one quarter leaf-mould, with a little sharp sand. Experience has proved that a soil of this kind, well mixed, and chopped up with the spade (not sifted), on an efficient drainage, suits it perfectly; but if peat cannot be had, then three-quarters loam, and one-quarter leaf-mould and sand might answer. In both cases, place a layer of some of the most fibry and rough soil over the drainage, with a view to make the latter act perfectly and permanently.

After potting, give a thorough watering, to settle the soil about the roots, and place it in a smart bottom-heat in a moist stove. When it shows symptoms of breaking, if the plant is weakly or drawn, cut it down to a prominent bud on the ripe wood; or in the case of a stronger plant, bend it down, in order better to equalize the flow of the sap, and cause the buds at the bases of the shoots to start simultaneously with those at their tops. Judicious watering, and occasional tying, will now be all that it will want, until it has filled the pot with roots, and requires a shift, which will probably be some time in June; for it must be remembered that it should not be allowed to blossom the first year. The point to be kept in view is, to have a good strong plant furnished in autumn with well-ripened wood, from which abundance of bright yellow flowers

may be expected the following season. About the beginning or middle of June, if all has gone on well, it will be found to have filled its pots with fine healthy roots, and should be shifted into an eleven-inch pot, using the same compost as before. After shifting, continue the generous growing treatment already recommended, until the end of autumn is approached, when water should be gradually withheld, and all the light and air that is possible given it, to ripen the wood well—an important point in the culture of all plants, but more especially so in that of the *Allamanda*.

Keep it all but dry during the gloomy months of early winter, and about the middle of February start it into growth. Prime the unripe tops off the old wood, and if a large and fine specimen is desired, shift it when it begins to break, and plunge it again in bottom-heat. Train the branches well out on a barrel-shaped trellis, which may consist of seven or eight nice hazel rods, of sufficient length, placed in the soil immediately inside the pot, fastened to a hoop about their middle, and then to a smaller hoop at their top. Bend the shoots of the plant round this, so as to cover it regularly, and when the young branches have begun to grow freely, train the strongest of them near the bottom of the trellis, so as to have your plant regularly covered with flowers, which it will be by the middle of July if the foregoing directions have been carefully carried out. In the third and fourth years it will flower earlier and better than in the second, and it will not require to be shifted; but it should be fed occasionally with clear liquid manure-water, to keep it healthy and vigorous, without being over-luxuriant. By liquid manure, I mean clear weak dung-water from the stable-yard.

LISIANTHUS RUSSELLIANUS.



FOR the decoration of the conservatory from the beginning of July to the end of September, few plants can compare with the *Lisianthus*. Indeed, the only fault this plant has, is that it requires a very strong moist heat to grow it in perfection, and it is also somewhat liable to damp off during winter; care, however, will prevent this, but unless a moist, high temperature can be afforded, while it is growing, it is useless to attempt its culture. The plant may be increased either by means of seeds or cuttings; the latter root freely, and if firm bits of young wood are selected about April, planted in sandy peat, covered with a bell-glass, and placed in a bottom-heat of about 80° or 85°, and guarded from damp, they will be ready to pot singly in about six weeks, and will form nice little plants previous to winter.

The usual method, however, of obtaining a stock of young plants is from seed, and probably seedlings are more vigorous than plants obtained from cuttings. The seeds should be sown as early in February as a temperature of 70° is at command. But unless some care is exercised as to the method of sowing the seeds, plants need hardly be looked for. Fit a pot nicely to a bell-glass, then half fill

the pot with crocks, and fill up nearly to the surface with rather fine peaty soil, and press it rather firmly, making the surface level, and cover the latter with a thin stratum of silver sand, and give a moderate watering through a fine rose, to make firm the surface, and prevent the seeds being buried too deeply. Sprinkle the seeds upon the surface thus prepared, and drop a little silver sand over them. Place the pot in a saucer of water, and never apply water to the surface of the soil until the plants are up and well-established, but keep the saucer regularly supplied. A cucumber frame, or any warm situation, will answer for raising the plants in, but if in a position where water from the syringe will be liable to fall on the pot, this will be dangerous in carrying the seeds beyond the depth at which they vegetate, and in this case the bell-glass should be large enough to throw off whatever water may fall on it. When the seedlings are fairly up, remove the glass, and inure them to the air of the house, or pit, giving plenty of water in the saucer, and also overhead. When sufficiently strong to bear handling, pot them singly in four-inch pots, and place them in a moist strong heat, affording them a shady situation until they get established in their pots, with a liberal supply of water. During summer let them occupy a position near the glass, but screened from the direct rays of the sun; top them as may be necessary to induce compact bushy specimens, and maintain a moist warm temperature.

If the plants were sown early and go on properly, they will probably have well filled their pots with roots by the beginning or middle of August, and such should be shifted into the next size larger pot, but only a small shift should be given at this period, as the growing season should be considered at an end by the middle of September. After this the temperature should be cooler and drier, and the plants should be gradually accustomed to a circulation of air, and full exposure to the sun's rays, giving no more water to the soil than is sufficient to keep the plants from flagging. The *Lisianthus* is a somewhat precarious subject to winter, being very liable to damp off at the neck, and beginners will act wisely in providing against all losses, by growing a few spare plants. I have wintered my plants in a close part of the greenhouse, with little or no loss, and also in a cool part of the stove, but I have occasionally lost severely in both situations. Whether in the stove or greenhouse, the soil should be very sparingly supplied with water, and the pots should be placed in flats, and water given in those, never wetting the foliage nor surface soil; and it will be unnecessary as well as dangerous to water oftener than may be absolutely required.

Maintain a night temperature of from 45° to 50° , which will be sufficiently high for the winter. Early in February remove the plants to a sharp, moist heat, of from 70° to 75° , or 85° will do no injury, provided a humid atmosphere is maintained. As soon as they start into growth, shift into pots a good size larger than those in which they have been wintered, clearing away as much of the sodden soil as can be done without injury to the roots. Keep them near the glass, and as warm and moist as is convenient, sprinkling overhead frequently with the syringe. Stop and peg down, or tie

out the branches, to secure handsome bushy specimens. When well established after this shift, remove them to their flowering-pots, which may be ten, twelve, or fifteen-inch ones, according to the season at which they are ready for their final shift, and the convenience for obtaining vigorous growth. Persons who cannot command a sufficiently high temperature early in spring to induce active growth, should give the plants a very moderate shift when they start into growth, and at the final potting put three in a pot. When established in their flowering-pots, they will be greatly benefited by a liberal supply of manure water, and the shoots must be tied out and stopped until the desired size of specimen is obtained. When in flower, they may be removed to the conservatory, greenhouse, or wherever their blossoms will be most valued; but in the removal care must be taken to prevent the plants getting injured. They should be gradually accustomed to the change by removing them to the coolest part of the pit or house previous to shifting them to a cool house; and they should then be placed where they will not be exposed to the direct rays of the sun, or drying currents of air. The flowers remain long in perfection, and well-grown specimens will last in full beauty from the middle of July to the middle of September, if properly tended with water, and placed in a situation where the blossoms will not be injured by damp.

Good fibry peat and loam, in about equal proportions, form a suitable compost for the growth of the *Lisianthus*. The soil should be rendered rather fine for small plants, adding a liberal proportion of sharp silver sand, but for the final shift it should be used in a rather rough state, and well intermixed with rough pieces of charcoal, with a moderate proportion of sand.

ROSES FOR WINTER BLOOMING.



FOR this purpose, a selection should be made from the Tea and Bourbon families, on their own roots, or budded very low. Presuming the plants bought from the nursery are in the small pots they are generally grown in for sale, they should at once be placed into those a size larger, carefully and freely watered, during this and next month, cutting off all the flower-buds they may show before September. About the middle of the latter month shorten the strongest shoots, and thin out the slender ones, turning the plants out of the pots, depriving them of some of the soil, and repot in those a good size larger, using a compost of turfy loam, sand, and manure in about equal proportions; they also like a little leaf-mould; put several pieces of broken crock in the bottom of the pot, then a portion of soil; place the plant so that the surface roots shall just be covered, and then filling with the soil; put them in a situation partially shaded, water sparingly, till they begin to grow, then expose them fully to the sun, and water freely every day. There

they may remain till the middle or end of October, when they should be removed to a pit to prepare them for flowering. Previous to their removal, the pots should be washed, and the plants neatly tied up. Where charcoal can be had, it will be found of great utility in the pot culture of roses, broken to the size of nuts, and about one-fifth mixed with the soil; the roots delight to ramble through it, and the foliage becomes of a richer and darker green; the surface of the soil must have frequent stirrings. The plants must be carefully examined, and whenever infested by green-fly, the latter should be destroyed by tobacco smoke.

Roses in pots are wonderfully benefited by a watering of manure-water now and then. This water is very easily prepared. Let droppings from the stable or cow-house be put into a large tub or barrel, with water kept over them for a week or two, occasionally stirring it up; the water may then be poured or drawn off for use. Guano water also makes a good manure. A quarter of a pound of guano in three gallons of water, frequently stirred before using, will be found very nourishing; indeed, one pound to sixteen gallons will be strong enough to use by the inexperienced, for if used much stronger than I have stated, it would injure plants in pots. In the open ground any of these liquids may be used stronger and rather more frequently.

STYLIDIUM FASCICULATUM.



WHEN found in the shape of large, well-managed specimens, with small bright, pinkish blossoms, nearly hiding the foliage, this *Stylidium* has a very cheerful and pleasing appearance, altogether different from that of the mass of plants which bloom at the same season.

Although rather delicate, and very liable to suffer from improper treatment, especially from excess of moisture at the root, yet if potted in a rich, porous soil, through which water can readily pass, and otherwise carefully managed, it will be found to grow freely, and to soon form useful sized specimens.

Cuttings made of firm bits of the young wood planted in sandy, peaty soil, covered with a glass, and placed in a very gentle bottom-heat, root freely. When just rooted sufficiently to bear handling, they should be potted singly in small pots, and kept rather close and moist till they have been established, when they may be inured to more light and air, in order to induce growth of a healthy character. Beginners, however, who can afford to buy healthy plants from the nursery had better do so; for this, like other plants of a somewhat delicate nature, requires more attention to propagate it successfully than many amateurs might be inclined to give it.

In order to be able to produce large specimens, one or two season's growth will be necessary before they are allowed to blossom. Plants procured at the present time may be induced to make considerable progress before the end of the growing season. They

should be placed in a cold pit or frame, where they can be screened from the direct rays of the sun in the event of bright hot weather setting in, and the atmosphere should be kept moist by sprinkling the plants, etc., on the mornings and afternoons of sunny days, shutting the frame up at a rather high temperature after the afternoon's syringing, but some air should be left in for the night. Aim at obtaining dwarf healthy growth, and regulate the treatment accordingly. If the pots are full of roots, give a moderate shift at once, as it is advisable to have the plants well established before the end of the growing season, and they should be prepared for winter by full exposure to the sun's rays, and a free circulation of air after the end of August. It will also be advisable to remove them to an airy part of the greenhouse by the middle of September, and to water them rather sparingly after that time. During winter give no more water to the soil than is necessary to prevent its becoming very dry, but when water is applied give enough to moisten the whole ball, and give no more until absolutely necessary again, allowing the plants to occupy a place near the glass free from currents of cold, damp air. About the middle of March they may be encouraged to start into growth by increasing the temperature to 55° or 60° by day, with sunshine and air, and 50° at night, and giving water more freely as they exhibit symptoms of growth. It will be necessary, however, to cut back last season's shoots, and this should be done as soon as any increase of temperature is given. The shoots must be cut back to within a few inches of the crown, otherwise it will be impossible to obtain compact bushy specimens. Give a moderate shift as soon as the plants start into growth after being cut back, but only to such as require it. If aphides make their appearance, which will very probably be the case with plants excited into growth early in the season, fumigate with tobacco-smoke at once. Keep the atmosphere in a healthy, moist state, and draw the syringe lightly over the plants on the mornings of fine days, especially when you are inducing them to start into growth. The same treatment may be continued during the spring, giving air and water more freely after the plants are in full growth, but avoiding cold currents.

In May, or early in June, the specimens may be removed to a cold pit or frame, or a quiet corner near the glass in the greenhouse will suit them. A second shift may be required by vigorous plants, and if so, this should be given as soon as it may be necessary, in order to get the pots well filled with roots previous to winter; and healthy plants not over-potted, will be benefited by an occasional supply of clear, weak manure-water during the growing season.

The autumn and winter treatment, already recommended, will be proper again, and if the specimens are not considered large enough for flowering, they must be cut back in spring, and permitted to have another season's growth. Flowering plants should be allowed to remain in the greenhouse until their blossoms expand, and they should be fully exposed to light to colour the flowers; they may then be removed to the conservatory, or wherever their presence will be most agreeable. After flowering, the shoots should be well shortened, weakly ones cut out, and the plants placed in a situation

to induce growth, giving a shift if necessary. Good turfy peat, with a very small proportion of light sandy turfy loam, must be used for the growth of this plant. The peat and loam should be broken up into bits about the size of a garden bean, and to three parts of this soil add one of sharp silver-sand, with a sprinkling of charcoal or broken potsherds. Be careful to secure efficient drainage, and never repot unless the ball is in a healthy, moist state, and the soil to be used in the same condition.

SILENE LACINIATA.



ALTHOUGH now seldom met with in collections, and hardly ever in a condition indicative of its being a favourite, this is a very useful subject for autumn decoration, especially where there is a little accommodation for the culture of plants that require a warm temperature. Properly managed specimens are thickly studded from July to the middle of October with bright scarlet, singularly shaped blossoms, which contrast well with the dark-green foliage, and with most other plants, producing a striking and very pleasing effect. The best time for taking cuttings is when the plants are in active growth; and short-jointed shoots, firm but not hard, should be chosen for the purpose. They should be inserted in light sandy soil, covered with a bell-glass, and placed in a close shady pit for a fortnight, and if then afforded a very gentle bottom-heat, they will soon emit roots and start into growth. Nothing is more injurious to this plant than a close, moist, warm atmosphere, and as soon as the cuttings show that they are rooted, remove the glasses. Inure them to light and air, and get them somewhat hardened before potting singly in small pots; and when this is done, place them in a shady corner of a cold frame, with a moist, but not warm atmosphere. As soon as they have become established after potting, stop them, to induce compact bushy growth, and place them near the glass, merely screening them from the direct rays of the sun for a few hours on the forenoons of bright, hot days, and admit air freely by raising the sashes at the back; but avoid drying currents, which would be the case were the sashes raised back and front. With good management, plants propagated early will be ready for a shift early in August, which should be given as soon as necessary, and every means used to keep them in vigorous health during the growing season. On the occurrence of damp cloudy weather in autumn, remove them to a situation in the greenhouse where they may enjoy all the light possible, without being exposed to currents of cold, drying, or damp, foggy air, and give no more water to the soil in winter than will suffice to keep them in a healthy state. About the middle of March, remove the plants to a light, rather moist pit or frame, where the temperature may average from 40° to 45° at night, allowing it to rise to 55° or 60° before giving air.

July.

This treatment will soon induce free growth in plants that have been properly wintered and are in good health, and such should be afforded a liberal shift before the roots become matted in the pots. In shifting, be careful to have the balls and soil to be used in a properly moist state, and apply water cautiously until the plants get established in their fresh pots, after which give air and water more freely, and treat them as recommended for last season. Attend to stopping the shoots as they advance in growth, and stake and tie them out, so as to induce compact bushy specimens; but plants intended to bloom in autumn must not be stopped later than the beginning or middle of June, and large specimens can hardly be produced to bloom the first year after propagation; but useful little plants may be grown in this time, and had in flower early in August. If it is decided to afford any of the plants another season's growth before allowing them to bloom, those should be shifted in July, or earlier, if the pots are full of roots, regulating the size of the pot by the season at which it is given, and the health of the specimen, avoiding a large shift late in the season. Winter them as already indicated, and be careful not to over-water at the root while the plants are in a dormant state.

The same treatment as directed for last spring may be resorted to, if the specimens are not sufficiently large, but discontinue stopping by the middle of May or beginning of June, and, as soon as they start into growth after the last stopping, keep them in a rather airy and drier situation, exposing them to full sunshine, except for a short time before noon, and very warm days, and then a thin shade only should be used, discontinuing it as soon as the plants are inured to bear the full force of the sun's rays.

When in flower, they should occupy a light part of a cool airy house. After their beauty is over, the stronger shoots should be well cut back, and the plants removed to a light airy part of the greenhouse, and winter with the same care as on previous seasons. When they commence growth in spring, the weaker shoots should be stopped or cut back, removing altogether as many of the weakly ones as can be spared. This will keep the specimens dwarf and compact; and, with care and watering, etc., and a small shift every other year, they will last for several seasons. If the plants are in good health, and the pots moderately filled with roots, they may be placed in a warm sheltered spot out of doors, as soon as summer weather commences, where they may be allowed to remain until they begin to expand their blossoms. For soil, use good fibry rich peat, light sandy turfy loam, and leaf-soil, in about equal proportions, and add an equal allowance of sharp silver sand and potsherds, or charcoal broken into small pieces. Break up loam into small pieces before it is used.

METALLIC GUARD AGAINST SLUGS.

BY A CORRESPONDENT.



IT was the circumstance of having had two seedling crops of a favourite flower, the ranunculus, destroyed by those wholesale devourers (slugs), that first stimulated me to seek for some effectual means of defence, and I may now exclaim "Eureka!"—I've hit it—in the discovery which I am about to propagate. It is at once elegant, scientific, cheap, effectual, and applicable to all cases, and will, I doubt not, be considered a valuable boon to florists and gardeners. It is the application of galvanism!—that power so mighty in the hands of the chemist, that by its agency he can convert soda and potash into solid metals, and consume the hardest metals themselves as a shred of paper in the flame of a candle.

This vast chemical power is generated by the simple process of placing in contact with each other numerous plates of zinc and copper with a piece of moistened cloth between the several pairs. By multiplying and increasing their efficacy (as in the galvanic trough), a power so great may be produced, as to destroy the life of an animal with the rapidity of lightning, and that by the merest touch.

It is by thus exciting this chemical power, in its simplest and fullest form indeed, on which depends the efficacy of the galvanic protector about to be described.

If a snail or slug be placed on a plate of zinc, to which a narrow plate or slip of copper is fixed, it creeps unmolested on its surface; but as soon as it touches the copper it receives a galvanic shock (its moist soft body acting as the moistened cloth above mentioned, and thus forming the galvanic circle complete), and immediately recoils, twisting itself back, and rarely venturing a second time to touch the copper to receive another shock.

This (to me) amusing experiment I have tried again and again, and, of course, always with the same results. To protect a seedling crop, then, or border, in frame, I have zinc plates of two or three feet in length, and four or five inches in breadth, with a strip of copper plate one inch broad, placed on the upper part, and secured close with two or three rivets.

These plates are fixed in the ground to the depth of a couple of inches. As just explained, the snail creeps up the zinc, but receives a galvanic shock as soon as its horns or head touch the copper, causing it to recoil and turn back: an insurmountable fence can thus, in a moment, be formed around whatever we wish to save from these marauders; and if made in a circular form, or in short lengths, the plates may be contrived to meet every possible exigency. I have myself used this protector in all cases with complete success, and a scientific gentleman of this place, to whom I acknowledge myself indebted for the suggestion of the principle, last year saved his dahlias (which on other occasions had always been nearly all

devoured by snails as soon as planted out) by cylindrical hoops of the zinc and copper plate placed around each plant.

If the tip of the tongue be placed midway on the zinc and copper at the same time, an unpleasant metallic or saltish taste is perceived; this is the sensation which proves so unpalatable and detrimental to the slug, and in which the protective power consists.

The cost of these plates is about sixpence per foot; they will, of course, last for an indefinite period.

SPARMANNIA AFRICANA.



AMONGST the multifarious pursuits which occupy the attention of mankind, the cultivation of flowers is, perhaps, the most delightful and instructive. The amateur who is in possession of a competency, a garden, and a greenhouse may retire from the stirring, and exciting turmoil of busy life, to contemplate the floral productions of nature, and have his mind soothed and strengthened by their benign influence. Among other things the cultivation of *Sparmannia Africana* is well deserving his attention, both from the beauty of its flowers and its easy culture; the flowers are produced in umbels, and are well elevated above the foliage; the petals are white, and the numerous stamens are particularly beautiful. A very interesting feature of the latter is their sensitiveness. During the months of April, May, and June, when the plant is in flower, on a calm, warm afternoon, when the sun is shining, let the flowers be examined, and the stamens will be found drooping, and crowded together, as if enjoying a tranquil repose; give them a smart tap with the finger, and they will separate and expand in a semi-globular form. The *Sparmannia* will succeed well, and flower freely, if grown in a small pot. It is a plant of free growth, and when placed in a large pot, it is apt to become naked at the bottom, tall and unsightly. About the beginning of March, select those shoots which are too weak to flower for cuttings; prepare them in the usual way, put each into a small pot, plunge the pots in a gentle bottom-heat, and shade the cuttings until they have taken root.

When well established, let them be finally shifted into a nine-inch pot; they will grow well in a five-eighths of good turfy loam, seven-eighths of peat, and one-eighth of silver sand. The plants should be encouraged to grow freely in the early part of the season, and the points of the shoots should be nipped off once or twice when growing, to make the plant more bushy, as it is naturally inclined to grow to a single stem. The stopping should, however, not be done later than July; in August the plants should be placed out of doors, in the shade at first, gradually exposing them to the full influence of the sun. This plant will survive the winter well in a greenhouse, merely protected from frost; but if placed in the most favourable situation with regard to light, it will produce a better display of

flowers. When done blooming, cut back the branches, in order to induce the plant to acquire a bushy habit; and when the young shoots have just made their appearance, turn it out of the pot, and reduce the ball of soil and roots; when repotted, let it be placed in a frame until it has made fresh roots, treating it in the same manner as plants from cuttings. If a few plants were placed along with early-forcing pelargoniums, etc., the treatment which suits them would forward the blooming of *Sparmannia*; and if placed in the conservatory, or where flowering plants are required, it would form no mean ornament in the collection.

Sparmannia is an old and much-neglected plant, but it nevertheless deserves a place amongst our spring flowers.

REMINDERS FOR GARDEN WORK IN JULY.



DIANTHUS.—Never trim off a single branch, unless it is in the way of others; train them out of each other's way, and take the neighbouring buds off any branch that has a promising flower on it opening for show; but a plant is as much distressed by the loss of its leaves and branches as it is benefited by the reduction of its flowers. The instant you see a flower will not do for a show, remove it; most of the early flowers should come off.

GERANIUMS may be cut down and the cuttings put in, if you want young ones; a common border and a hand-glass are sufficient.

HEARTSEASE.—Propagate from small side-shoots whenever you can take them, they make better plants than older cuttings, though the latter will do. Plant out seedlings that are large enough in rich and strong soil, but not too heavy.

CARNATIONS and PICOTTEES.—Regulate the number of buds and tie up the advanced ones, as directed for pinks, only that when you have tied them you may tear down the calyx from the top to the tie, and thus release the petals all round alike; prepare the card also, and regulate the petals as they perfect themselves. The shoots at the bottom may be either layered, if they are long enough to bend down under the soil, or pulled off and piped, like pinks, if they are short, only that they must be struck with a slight bottom-heat under a hand-glass, instead of in the cold open ground. They are thus layered; cut off the leaves, all but those on the three upper joints, about a third of an inch below the second knot or joint under those leaves, which would be three inches from the top, and on the bottom side of the stem cut a slit sloping upwards towards the middle of it, passing the knife through the joint, but carefully abstain from coming more than half way; then, as carefully, cut off the piece that is below the joint so as to cut close up to it; this done, stir up the soil in the pot, and mix some sand with it; peg this layer down into the soil below the surface, so that the plant will, with the split joint attached to it, be exactly upright, and the split will be open; press the earth gently about it, and so proceed with more; water, and lay them by, to finish their bloom, and till these layers strike root.

CHRYSANTHEMUMS, the most untidy of all our flowers, can only be grown dwarf by taking off cuttings now; prepare a little bottom-heat, take off the strongest tops three inches long, cut them close under a joint, take the leaves off one inch high, and let this inch be set in rich sandy soil, in a pan or pot plunged into the heat, the glasses covered close over and wiped every day, occasionally refreshed with water; they will soon strike with good management, and should be potted off into forty-eight sized pots, and after a few days to establish them in the shade they should be placed in an open situation where they will have all the

sun ; but where they cannot strike their roots into the ground here they must grow until the middle of September, but must never be neglected. Watering will be essential, for if permitted to want moisture they will lose their foliage at the bottom. They will, many of them, flower at twelve inches high. The old roots may be planted in the ground to grow for young stock, and flower if they will in the borders.

ANNUALS, sown late, must be thinned if too thick, and the plants pulled out may be planted anywhere. In mild autumns these late sown and late planted annuals prolong the beauties of the garden.

MAKE Strawberry-beds of the strongest runners, but to anticipate this the runners may be pegged down in June, in pots placed on the old beds, and they will have struck root sufficiently to turn out in the new beds, or to force in the pots.

STONE FRUIT TREES may now be budded in the same way as roses, except that it is well to cut down the stocks to within a few inches of the ground, and bud these, so that for standards, the new variety forms the trunk. Proper sticks may be had at the nurseries.

TRAINED FRUIT TREES should have useless roots removed, and such shoots taken back as are required to throw out laterals, or are wanted for bearing. Maiden fruit trees making their first shoots should be topped in early growth and they will form side branches strong enough to save a year in the training. Standards must of course be allowed to run up until they arrive at the length required for the trunk.

VINES require the same continued management as before directed.

ALL fruit bushes and trees should have their useless spindling growth cut out, currant and gooseberry trees especially, whose fruit ought to be thinned, so as to give the remainder the whole nourishment of the tree.

SCARLET BEANS.—Put sticks to them, or give them some other means of support.

POTATOES.—Earth up well to cover the tubers, and give them room to swell.

LETTUCE, RADISH (the turnip kind), and SALADS.—Continue to sow enough to meet the consumption.

CUCUMBERS.—Train the shoots along the surface so as to be out of each other's way, and give the fruit room, and water must be administered.

PLANT a main crop of celery, use the strongest plants, dig trenches a foot to a foot and a half wide and a foot deep, four feet apart from centre to centre ; put good three inches thick of rotten dung in the bottom, and fork it six inches into soil, well mixing it as you proceed ; level, and plant nine inches apart down the centre of the trench, these to be earthed up as the plants advance.

WINTER Greens, Brocoli, Savoys, Borecole, Brussels Sprouts, Red Cabbage, Scotch Kale, etc., should be planted after dripping weather ; a rainy season saves enormous labour. Sow Winter Spinach.

BEANS.—Top those in flower, and earth up others.

TO CORRESPONDENTS.

GUANO WATER.—*R. B., Longton.*—Half a pint of guano dissolved in six or eight gallons of water, and applied as required, will be found of service to many kinds of flowers ; but no fixed rule of application can be given, for what suits one kind of plant might kill another. As to vegetables which are wanted to grow quickly, you can hardly go wrong with them. Of course, they will take stronger doses than flowers.

CLUBBING.—*Subscriber.*—The disease called clubbing originates in the soil ; but the grub which causes it sometimes attacks the plants while in the seed-bed.

WALKS —*Amateur, Devizes.*—Excellent walks may be made by mixing well-washed gravel, lime, and hot gas tar, in such proportions as will form a black mortar. If laid four inches thick, it will last a very long time, always be dry, and no weeds will grow on it. If thicker, and on a layer of chalk or gravel, so much the better.



FERN COLLECTING,

AND THE FORMATION OF AN OUT-DOOR FERNERY.



FERNS are so widely distributed that, wherever a rural walk is possible, it is almost certain somewhere in the district ferns may be found. The south-western counties of England constitute the home paradise of the fern collector; but, as we must find our happiness where our lot is cast, it is better to make the most of the ferns within our reach, than to repine if Cornwall and Devon happen to be *terra incognita*. In the neighbourhood of London are many localities rich in ferns, but, as these are for the most part pretty well known, we shall not enumerate them, but proceed at once to make some remarks on collecting ferns for cultivation. It is only during the height of summer that the deciduous kinds can be readily found by inexperienced collectors, and it is at that season that fern hunting proves a particularly agreeable pastime. It would be better always if the ferns could be removed from their native sites when first about to commence their new growth in the spring, and this can be done sometimes by searching in woods and hedgerows for old fronds, and tracing them to their source. The roots should then be taken up without injury to the crowns, and be at once planted or potted as required, and assisted with shade and shelter until established in the places assigned them in the garden. Experienced collectors may hunt for ferns during the winter to great advantage, in districts where they are known to abound, as, in the event of a mild season, many of the deciduous kinds will be still green; and evergreen kinds, such as harts-tongue and common polypody, may be better lifted in winter than at any other season. But, as a rule, fern hunting is a recreation for summer time, and any fern may be taken up in the height of summer and be kept with the utmost certainty for cultivation. The worst that is likely to happen is the loss of all the fronds they carry at the time of taking up; but a new crop will soon succeed them if proper care be taken. The fern collector should be provided with aids and implements adapted to the country in which he is about to make explorations. Where only terrestrial and hedgerow kinds are expected to be found, a large basket—or, better, a pair of baskets of moderate size, such as can be carried one in each hand—will be necessary. They should have close-fitting lids, because if ferns are taken up on a hot day, and exposed for some hours to the atmosphere, the crowns and roots will be so much exhausted that some may die, and all will be injured, whereas, by packing them close, with a little moist moss amongst them, the roots and crowns will be kept tolerably fresh until they can be potted or planted out. A short-handled three-pronged fork and a trowel, and a strong clasp knife will be needful; and in some instances it will be necessary to borrow a spade or digging-fork near the spot where operations are to take place; for fine old roots of royal osmund, and other large-growing ferns, will defy the

leverage of all small hand-tools. When ferns of large size are taken up in the height of summer, *it is best to cut away all or nearly all their fronds at once, and use those fronds as packing material.*

On reaching home, the best treatment to subject them to is to pot them all separately in the smallest pots their roots can be got into, with cocoa-nut fibre alone, or the fibre of good peat or leaf-mould, and shut them up in a frame, and keep only moderately moist until they start into growth. As at this early stage of the study we may suppose you do not know how to pot them and restore their energies, we will endeavour to point out a simpler mode of procedure. Find a very shady place in the garden, and there make a bed of leaf-mould or peat-soil, or cocoa-nut fibre refuse, and plant the ferns in it, as close together as possible. Then cover them with bell-glasses or common hand-lights, and sprinkle them with water every evening, but take care not to make them very wet at the roots. They will soon begin to grow. In the spring following you may plant them in the fernery.

Small ferns found growing on rocks and walls must always be carefully dealt with. The little maidenhair spleenwort will sometimes send its black wiry roots quite through the substance of a nine-inch or fourteen-inch wall, and to remove it with complete roots is then quite out of the question. By loosening a portion of its hold just below the crown of the plant, roots may generally be obtained sufficient to enable it to re-establish itself under cultivation. A strong chisel and a hammer will be required in undertakings of this sort, and it may be well to add a little discretion also, especially as to the extent to which walls—the property of somebody—are to be injured for the sake of a tuft of fern worth but a few pence, and of which specimens may be obtained more easily by further search, without any necessity for the infliction of damage. Ferns found growing on and amongst rocks should always, if possible, be obtained with portions of the rock to which they are attached. If this cannot be accomplished, carefully tear the plant from the rock in a way to injure the roots as little as possible. Good pieces will soon emit roots and fronds if properly treated, especially if kept moist by packing in moss or sphagnum from the first moment of obtaining the specimen. Allow me to remark, further, that the passion for fern collecting has in many instances been carried to a ridiculous excess by persons who merit the title not of fern collectors so much as fern destroyers. Let every genuine lover of ferns be on his guard both to discourage reckless fern collecting, and to protect, as far as possible, the few remaining localities of scarce British ferns. It is not many years since we saw amongst a heap of dried mosses, ferns, grasses, etc., in the possession of a lady, a *sheet* of Tunbridge fern nearly a yard square. This had been torn from its native site, carefully rolled up like a piece of old blanket, and put away, and was afterwards brought forth as a trophy, and preserved as a memorial of the days “when we went gipsying.” The value of that sheet, when fresh, might have been about £5, and no doubt any nurseryman could make a larger sum of a good square yard of the Tunbridge fern. Such reckless destruction, such base



LASTREA DILATATA, VAR. LEPIDOTA.

contempt for the value set upon a rare fern by those who understand its history and its habits, and appreciate the interest that arises out of its beauty and rarity combined, is to be considered as a crime; and, though there is no law to punish the perpetrator, except in cases where there might be an action for trespass or wilful damage, it is the duty of every conservator of our native flora to visit crimes of this kind with the sternest disapprobation, accompanied with truthful explanations of the injury done alike to natural scenery and to science, by such acts of spoliation.

If you can dig up ferns in early spring, you may plant them in your fernery at once; and, if shaded for a time, and frequently sprinkled with water, taking care always not to make the soil about them very wet, they will soon begin to grow vigorously, and after that patience is the only quality required on your part to ensure your proper reward.

You will soon learn to distinguish ferns from all other plants when you meet with them. When you find a fern, take notice of the soil and situation it is growing in, and in attempting its cultivation imitate those conditions as nearly as possible. The pretty wall rue spleenwort loves to grow in the full sun, upon and amongst sandstone rocks. You will see plenty of it on the approaches to the Suspension Bridge at Clifton, and you may find the common maidenhair spleenwort keeping it company if you look sharp. It is in the shady, dank, almost dripping hollow, or on the slope of a water-course, that you are most likely to find the lovely lady-fern, the hard fern, and the royal osmund, yet these will sometimes make a bonny show upon dry banks beside a dusty highway, where, perhaps, for miles the common lastrea is the prevailing fern of the district. In Epping Forest there are thousands of pollard trees, on the awkward stems of which are perched, like wreaths of honour, tufts of the common polypody. If you want to see the bracken you need not travel far, but if you would cultivate it you must notice that it grows to its grandest stature on mellow, yellowish loam, and is rather poor and stunted on sand and peat, though not always so. Observe always how they look when they are at home, and thereby learn to persuade them to believe themselves at home when you have planted them in the garden. Some thrive on perpendicular walls of stone and brick, others in the moist woodland shade, others on the bleak mountain top, and many a glorious group may be found on the sides and roofs of caverns, which they make like fairy palaces with their green feathery plumes and golden dottings of mysterious fruit. However many lessons you may learn of the habits of the several kinds of ferns, there should be one lesson impressed upon your mind more deeply than any—it is this, that, much as they love moisture, it is a most rare thing to see a fern growing with its roots naturally in water. When they congregate, as it were, to drink of the brook that passes by, they keep their feet clear away from the current, and lodge safely on the slopes that dip towards the water; or stand proudly upon little islets that compel the stream to sing as it passes them; or on banks and hummocks round about where they can enjoy the tiny splashes the

trout make when they leap for flies, and the soft nourishing vapour that rises day and night amongst their shining fronds. Yes, it is upon slopes mostly that ferns love to grow; in places where water rarely lodges, but where moisture is abundant, and there is some shade against the noonday summer sun. Note all you see of the whereabouts and ways of your favourites, and you will find that there is a better book on fern-growing than the one you are now reading—it is the *BOOK OF NATURE*.

If you cannot go collecting you may be able to dip into the tempting basket of the itinerant fern vendor, who is sure to be able to supply you with the Male fern, or *Lastrea filix mas*, which is the hardiest of all, and will grow almost anywhere; the Hard fern, or *Blechnum spicant*; the harts-tongue fern, or *Scolopendrium vulgare*; and the Lady fern, or *Athyrium filix femina*, of which there is one beautiful variety (*Acrocladon*), which is sometimes referred to as the “Queen of the Lady Ferns,” a title of which it is well worthy, indeed its exquisite foliage is unequalled in the whole range of British botany. You must not, however, expect to readily obtain this variety from the itinerant vendor, as at the present time it is at once the rarest and most remarkable of the British species. With these four you can make a good beginning. It is usual to construct the outdoor fernery of some sort of “rockwork,” and for two good reasons: first, because the forms and hues of ferns are more effectually displayed when their bright green tufts rise out of grey stones or dark burrs from the brick kiln; second, because they thrive better, when planted in gardens, if their roots are protected from excessive evaporation by the covering of the soil with stones and vitreous masses. Many a tiny fernery do we see in our travels placed at the entrance to country villas and cottages, where we should never think of placing them, yet they look quiet and pleasing, and suggest to all passers-by that those who planted them did their best to vindicate the quiet beauties of God’s great harvest, knowing that for more demonstrative forms of vegetable splendour vindication was unnecessary. When little ferneries like these are constructed, only the commonest and most robust-growing ferns should be planted in them. Generally speaking, the common soil of the place will do, but if a quantity of leaf-mould or cocoa-nut fibre can be mixed with it the better. If there is any doubt about the soil of the place being suitable, get some sandy or peaty earth from a common where ferns and heather are found in plenty, and have enough to raise the position above the general level, then cover it with stones or burrs, and plant the ferns between. There are sorts well adapted for this simplest form of fernery, namely, the four just named, as likely to be found in the fern-dealer’s basket, and the following:—the Bracken or Brake, *Pteris aquilina*; the Broad Prickly Buckler fern, *Lastrea dilatata*; the royal Osmund, *Osmunda regalis*; the common Polypody, *Polypodium vulgare*; the Common Shield fern, *Polystichum aculeatum*. Many more may be added if the soil is a mellow, friable yellow loam, with plenty of sand in it, but it will be well to get a little used to ferns before launching out into grand speculations. When you have had some practice in this



ADIANTUM FILIX-FEMINA, VAR. ACUTILABE.

humble way, and have, perhaps, succeeded in growing a few ferns in pots in a frame or in a fern-case in the drawing-room, you will



become ambitious, and resolve on having a grand fernery, with, perhaps, a model of a ruin for the main feature of the scheme.

Outdoor ferneries are usually formed of tree roots and banks of

August.

earth, picturesquely disposed and planted with ferns severally adapted to the sites and positions the scheme affords. Where there are living trees on or near the spot (and the shade of large trees is desirable), the use of roots is objectionable, because of the quantities of fungi which are sure to be produced, the mycelium from which may find its way among the living roots and commit vast havoc. But even this danger is worth risking sometimes in cases where roots and butts are plentiful on the spot, and it is undesirable to incur any great expense. The foundation of all banks and earth-works for ferns should be good loam or clay, into which many of the stronger-growing kinds will send their roots when well established. But the upper crust and the stuff for filling in between roots, burrs, etc., should consist of half peat and half silky yellow loam, or some mixture which nearly approximates in character to such a combination. Thus, good loam with well-rotted cocoa-nut fibre, or loam mixed with yellow leaf-mould and manure that has lain by three or four years till rotted to powder. It is best to complete the structure and fill in all the more important places intended for soil before inserting any of the plants, for the simple reason that the work must be firm, the soil well rammed in, and the whole of the scheme so substantial that there will be no fear of any portion shrinking away afterwards, and leaving the roots of the ferns without soil, or causing hollows and crevices between the blocks and the banks into which they are set.

ACHIMENES.



THE various attractions of this lovely tribe of plants render them specially adapted for decorative purposes. Their numerous gay and pleasing shades of colour, their variety of form and foliage, combined with a generally easy cultivation, and their flowering in a small state, are all qualities which especially recommend them to the notice of amateurs of limited means. Though essentially summer-flowering plants, the season of bloom may be prolonged for some months by a succession of younger growth; and where a sufficiency of light and heat can be obtained, some kinds, as *Picta*, and others of like habit, may be kept in flower during winter. Their more attractive season is, however, the summer and autumn months. During the growing period, they delight in a warm, moist atmosphere, and when in bloom, they may be removed to a close part of the conservatory or greenhouse, or, if required, to a sitting-room, but the blooms will not be so fine there as in a more genial atmosphere. The general method of obtaining plants is from the small, scaly-like tubers of the previous year's growth, which are produced in abundance. For winter blooming it is, however, more desirable to propagate from cuttings put in in the latter part of summer.

This method is also adapted for increasing new or rare kinds; but this being more the nurseryman's province than that of the

amateur, I shall confine myself to general management. The time at which the tubers may be started, must depend on the season at which the plants are required to bloom; if started in February, the more dwarf-growing kinds will flower early in June, and a succession of tubers planted up to that time will ensure blooming plants to the latter part of autumn. Presuming that a supply of tubers of desirable kinds are at hand, they should be carefully shaken out of the soil they have been kept in during their season of rest, some well-drained pots or pans should be provided, and filled to within two inches of the top, with a light rich sandy soil. On this the tubers should be placed rather thickly, and covered to the depth of an inch; they should then be removed to a close warm situation; a pit or frame, where a little bottom-heat is available for plunging the pots in, is most suitable when started early in the season. Water should be given sparingly until the plants appear above the soil, when a more liberal supply will be necessary; but in this and the later stages of growth it should be judiciously applied, as the *Achimenes* is very susceptible of injury by overwatering at the roots. When about two inches high, the plants may be potted in six or seven-inch pots.

If it be desirable to flower them in this size, from four to six plants will be sufficient for each pot; but if larger specimens can be conveniently accommodated, a large number, say eight or twelve plants, will be requisite. After potting, place them in a close, warm house for a few days; when re-established, air may be admitted freely on favourable occasions; and the plants kept near the glass, to prevent their becoming drawn; a slight shading will be required in bright sunny weather, and a genial, moist atmosphere must be maintained.

When well rooted and in vigorous growth, the plants should receive a final shift into pots or pans; the roots delight to ramble near the surface of the soil, and for this reason I prefer pans for large specimens; these are from twelve to sixteen inches deep; over the bottom I place an inch of broken potsherds, and on this a thin layer of fibrous matter to prevent the soil mixing with the drainage. If pots are used, one-third of the depth may be safely filled in the same manner. In potting, the ball of soil should be placed as entire as possible in the centre of the pot or pan, sufficiently below the top to allow a slight surfacing of mould among the plants when filling up with soil. After completing this operation, remove the plants to their former quarters, where the advantages of light and warmth can be derived, and encourage a vigorous growth by keeping up a moist atmosphere. As it becomes necessary, attention will be required to tie and otherwise neatly train the branches, so that they may present a compact mass of bloom. Some of the more erect, strong-growing kinds may be stopped once or twice during their growth, to preserve a dwarf habit. When the plants are in bloom they must be carefully hardened before removal to a cooler situation, and they should at all times be guarded against currents of cold air. After flowering, the plants should be again placed in a warm house, and water gradually withheld so as to

mature the tubers. When the soil becomes quite dry and the foliage decayed, it should be cut off down to the surface of the soil, and pots should be placed on a dry shelf secure from frost, where they may remain until required for the following season. The soil most suitable for the growth of the *Achimenes* is, equal parts sandy loam, peat, and well-decomposed cow-dung, adding a liberal supply of sharp clean sand. The loam and peat should be broken into small pieces, the cow-dung sifted, and all well mixed together previous to use.

THYRSACANTHUS RUTILANS.



ALTHOUGH this plant is not likely to be a favourite where only dense compact specimens are looked upon as worth cultivation, it is, nevertheless, a very useful plant for winter flowering, and will, doubtless, be largely grown for this purpose. The bright scarlet tube-shaped flowers are produced for months in succession on drooping spikes, some two or three feet long, which look interesting, and form a fine contrast with other plants. So far as my experience goes, however, there is no possibility of inducing it to form a compact, well-furnished specimen, for if stopped to the extent necessary to do this, it loses its leaves, and refuses to grow at all. But this is of very little importance, as if a large bushy specimen could be grown, the flower-spikes, except those from the outside shoots, would not be seen to any advantage.

Cuttings planted in sandy, peaty soil, covered with a bell-glass, and planted in a sharp bottom-heat, soon emit roots, and if these are put in early in spring they will form nice plants for flowering next winter. The cuttings should be potted singly as soon as they are well rooted, and placed in a close, moist, warm pit, or house, till well established; and if they can be afforded a gentle bottom-heat, this will greatly assist in promoting the emission of roots, and inducing full growth. The young plants must never be allowed to suffer for the want of pot room, as this tends to make them even more leggy than they are naturally inclined to be; therefore, until the plants are in their flowering pots, attend to shifting before the balls get over-matted with roots. The best situation for the young plants during the growing season is a pit, or house, where they can be kept rather warm, close, and moist; and if they can be afforded a gentle bottom-heat, this will be of great service in promoting vigorous rapid growth. A slight shade will be necessary on the forenoons of bright, hot days, and the plants should be sprinkled over-head morning and evening in fine weather, affording them a liberal but careful supply of water at the root, and giving weak manure-water occasionally to those that have well filled their pots with roots. Beyond keeping the centre shoot secured to a stake, very little good can be done in the way of training or stopping, for the plant never seems to grow freely or with any vigour, except when one shoot is allowed to take a decided lead of the others.

Side-shoots, however, are produced very freely when the plants are grown rapidly in a brisk, moist temperature, and kept near the glass, and these should be slightly tied out without bending them down, so as to afford the foliage sufficient space. The habit of the plant, however, although it is what is deemed bad by plant growers, is exactly suited to the inflorescence, for the long drooping spikes of bright-coloured flowers would not be half so effective if produced on dwarf, bushy plants. But if, from any cause, side-shoots are not produced freely, the plant should be bent down, leaving the eyes which are wished to start into growth the highest, which will check the growth of the leading shoot, and more effectually promote the growth of others than stopping would do.

Discontinue shading, and expose the plants freely to sunshine after August, admitting air more freely, to induce short-jointed wood. Attend, however, carefully to watering, and do not let them sustain any check, as with proper attention they will grow very freely till late in autumn. If the plants are wanted to flower early, they should be sparingly supplied with water, and kept rather cool for a few weeks; but they must not be allowed to get too dry, as this would injure the foliage; and, except for plants that are wanted to flower early in winter, there will be no artificial treatment necessary to induce them to flower profusely, which they will do from January till May. The time at which they will blossom will, however, depend upon the temperature; for, unless this is rather warm, they will not flower so early. When in bloom, they must be kept in a temperature of not less than 55° or 60° ; for the flowers do not open in the temperature of an ordinary conservatory, nor do the spikes attain any length in a cool place.

In order to preserve the plants in beauty as long as possible, avoid wetting the flowers in syringing, and keep the plants in good health by attention to watering, etc. After their beauty is over, remove them to where the temperature may be kept at about 50° , and allow them about a month or six weeks to recruit their energies after blooming, cutting back the shoots as may be deemed proper. Before placing them in heat, give a liberal shift if necessary, and when the buds start keep the stronger shoots tied out, bending down and stopping any that may incline to outgrow the others, and syringe, etc., as recommended last season, only that bottom-heat may be dispensed with in the case of plants that are some size. And as there will be no necessity to keep them growing late in autumn, a plant or two for early flowering may be removed to a rather cool place and sparingly watered until the growth is checked, and then returned to the stove, where they will soon flower.

The *Thysacanthus* is a vigorous grower, and not very particular as to soil, except that it should be rich and light, and efficient drainage should be secured in potting. About equal portions of turfy peat and loam, with plenty of sand, will suit perfectly, and a little thoroughly decomposed cow-dung would do no harm.

POT CULTURE OF THE VERBENA.

BY A CONTRIBUTOR.



VERBENAS merit a place, and most justly, among popular florists' flowers, and perhaps a few hints on their cultivation in pots may be acceptable to those who have not hitherto adopted that mode of culture. I know of no plant more useful or ornamental as a pot plant, for decorating the greenhouse during the summer season, when the proper inmates of that structure are enjoying the open air. If we take into consideration its graceful habit, the variety and brilliancy of its colours, which offer hues for every taste, and, above all, the lengthened period it continues to produce its lovely blossoms, it is unrivalled, and ought to be more generally grown in pots as specimens, more especially now that the numerous varieties are so much improved, both in form and colour. This present season has been productive of some gems of the first class; and if the verbenas continue to be improved as it has been during these few years past, I have no doubt that the time is not far distant when it will form one of the leading features of our floral exhibitions. I do not know if my system of propagating this favourite be new; but as it is simple, certain, and expeditious, it may be as well to state how I proceed from the commencement.

I fill shallow pans (such as are used for placing under flower-pots) to within a quarter of an inch of the top with silver sand, and pour in water sufficient just to cover the sand. I then make the cuttings in the usual way, and push them into the wet sand, put the labels to them, and place them in a hotbed frame where the heat ranges from 65° to 70°, always keeping the sand wet. The advantages to be realized by propagating the verbenas in this way are, that the cuttings never require to be shaded in the brightest sunshine, consequently the young plants are not drawn up long and lanky; the cuttings never stop growing from the time they are put in until they are ready to pot off, which is in about six or seven days, when they may be drawn out of the wet sand, with a bunch of roots, without injuring a single fibre. The best time to commence operations for growing specimen verbenas in pots is February, or as soon as vegetation commences for the season. It is desirable to pot a few of the best autumn-struck plants for the sake of early bloom; but they never make such handsome specimens, nor continue so long in good health, as plants raised from cuttings in spring. As soon as the cuttings are well rooted, they should be potted into three-inch pots, and placed in a gentle heat for a few days, until they are established in the pots; then top them, and harden them by degrees. Never allow them to remain long after they begin to grow, or they will form long, naked stems. As soon as the pots are filled with roots, shift into six-inch ones, and from these into eleven-inch pots. During the growth of the plant, all shoots must be stopped in order to cause the plants to grow bushy; and never allow them to flower until the plant is properly formed, and has as many leading shoots

as are wanted. The compost in which I grow the verberna is—equal parts turfy loam, leaf-mould, and peat, with a little silver sand added, to keep the soil open. I water twice a week with liquid manure, and occasionally syringe overhead with clean water to cleanse the foliage. If the saving of the seed is no object, all flowers ought to be cut off as soon as they begin to decay. I need scarcely add that the grand secret in the successful culture of this, as well as of all plants, is efficient drainage; without this, no plant will continue long in good health. If green-fly should attack your plants, fumigate with tobacco; for if the fly once gets ahead, the plants will never recover sufficiently to give satisfaction. Mildew is another enemy which must be looked after. As soon as it is perceived, dust the plants with a little sulphur, which will stop it from doing much mischief.

LINUM TRIGYNUM.



THIS is a showy and useful plant for autumn and early winter decoration, producing, as it does, its large, bright yellow blossoms freely for some two or three months together, and if guarded from damp, the individual flowers remain a comparatively long time in perfection. The temperature of an intermediate house is, however, necessary during the period the plant is in bloom, for if kept in an ordinary greenhouse the flowers will be produced but scantily, and their beauty will be but short-lived, whereas, if afforded a temperature of from 50° to 55°, well-grown plants will be very attractive objects for a considerable time. I will suppose that young plants are in hand early in spring, and although this is their natural season of rest, yet with the view of securing a long season of growth, they may be placed in a growing temperature about the middle of March. Choose a situation near the glass, where a moist atmosphere can be maintained with a moderate circulation of air, when the state of the weather will permit, and let the temperature range from 50° or 55° by night to 60° or 65° with sun-heat. Take an early opportunity, after placing the plants in growing circumstances, to examine the state of the roots, and repot such as may require it. Unless, however, the pots are moderately filled with roots, it will be better to clear away any unkind soil, and thoroughly repair the drainage, repotting in the same sized pots until the roots have acquired a healthy condition, which, with careful attention, will soon be the case; the plants should then be afforded a liberal shift—say, into pots two sizes larger than those in which they have been growing. Syringe overhead morning and evening, but apply water cautiously to the soil for a week or two after potting, for the roots are impatient of overmuch moisture, and if the fresh soil is overwatered and allowed to become sodden, the health of the plant will be injured, and there will be considerable difficulty in getting it to make a vigorous start.

August.

This *Linum* has a free habit of growth, and requires frequent stopping to secure compact, bushy specimens; and the shoots should be kept regularly tied out, so as to admit light and air, which greatly promote close growth, and save the necessity for stopping so frequently. Maintain a moist atmosphere, and syringe overhead frequently during bright weather; and if red spider makes its appearance, which, unless the plants are kept in vigorous health, will probably be the case, place the affected plants so that the under sides of the leaves can be well washed with the syringe, and see that this pest is thoroughly eradicated before it gains a footing. During the summer months the plants may occupy a warm corner in the greenhouse, but a cold pit or frame, which can be kept rather close, will be a more suitable situation. A second shift will probably be required towards the middle or end of May, and this should be given as soon as necessary; it will be advisable to avoid repotting near the time for removing the plants to their summer quarters. Although a high temperature, maintained by means of fire-heat, would be decidedly injurious, it will be advisable to keep the atmosphere rather close, and shut up early after syringing in the afternoon, and a slight shade should be afforded for a few hours on the forenoons of bright days. When the plants are well established in their flowering-pots, manure water, in a clear, weak state, may be given two or three times a week; this will greatly assist in promoting vigorous growth. On the occurrence of unsettled weather in autumn, remove the plants at once to a light, airy situation, where they can have the assistance of a temperature some ten degrees higher than that of the greenhouse, and where they can be allowed a free circulation of air in fine days. If they should be wanted to blossom earlier than they may appear prepared for, keeping them rather cool and dry for a fortnight, and then replacing them in a moist, warm situation, will check the tendency to growth and induce the formation of blossom buds. Care should be observed that the foliage is perfectly free from red spider previous to the appearance of blossoms, for it will be difficult to keep it under when the syringe cannot be used. After blooming, the plants may be placed in any spare corner where they will be safe, and not exposed to currents of cold air, and they should not be excited into growth early in spring, unless where very large specimens are desired; they should be allowed to remain at rest until towards May, giving water very sparingly while they are in a dormant state, and avoid wetting the foliage during damp, cloudy weather.

Before placing the plants in a warmer temperature, turn them out of the pots and ascertain the state of the roots, etc., and either give a moderate shift or repot into the same sized pots, after repairing the drainage and removing any unkind soil, as the state of the roots may require. The treatment during this season need not differ from that recommended for last, and with careful management and a small annual shift they will last for many seasons; but the shoots must be cut back rather closely when necessary, to prevent a naked appearance, and they may be disrooted sufficiently to allow fresh soil to be given without increasing the size of the pot. It

will, however, be necessary to afford them a close, rather warm situation, to induce the roots to start after being cut back. Turfy loam and peat broken into small pieces, and liberally intermixed with sharp silver sand and lumpy bits of charcoal, form a suitable compost. Cuttings from short-jointed pieces of the young wood root freely; they should be selected as early in the season as is convenient, planted in light, sandy, peaty soil, covered with a glass, placed in a very mild bottom-heat, and guarded from damp. When sufficiently rooted to bear handling, they should be potted singly in small pots, and placed in a close, warm situation till established, when they should be inured to a cooler atmosphere, more light and airy, and be kept growing steadily until the approach of winter, when they may be placed in a warm part of the greenhouse, and sparingly supplied with water at the root until they can be removed to a growing temperature in spring.

THE BALSAM.

BY A SUBSCRIBER.



FEW plants are more generally cultivated or more useful for the decoration of the greenhouse during the season when its ordinary inmates are placed out of doors than the Balsam, but in the hands of amateurs it is seldom well-grown. It is a plant of exceedingly vigorous habit, and unless its energies are properly directed from the commencement it speedily assumes a lanky, naked appearance, which no after care can correct. Seed may be sown any time from the beginning of March to the middle of May, according to the season when the plants may be wanted to be in flower, and the convenience for treating them properly after they are up. Sow thinly in well-drained pots filled with light, sandy soil, covering the seeds lightly with the same material, and place them in a moist warm house or pit to vegetate. As soon as the plants appear, the pots should be placed close to the glass in the lightest part of the house, and air admitted on every favourable occasion; for the aim from the first should be to induce stocky robust growth, and this cannot be effected without the aid of light and air. When the first pair of leaves expand, pot singly, in four-inch pots retaining the plants in a moist gentle heat; and, if necessary, afford them a slight shade for a few hours in the forenoon, and maintain a moist atmosphere, until they get established in their pots, which, with ordinary care, will soon be the case; afterwards, they must be freely exposed to light and sunshine, and be afforded a free circulation of air by day whenever the weather will admit, shutting up early in the afternoon after syringing. Very little time will elapse before the pots will be filled with roots, which should not be allowed to become matted before shifting, otherwise it will be difficult to keep the soil properly

moist, and prevent the appearance of red spider. Use seven-inch pots for this shift, keeping rather close, and watering less freely for a few days after potting, while the roots are laying hold of the fresh soil, but use the syringe freely, sprinkling the plants overhead morning and evening. When established after this shift, give a liberal supply of water, and to do this will probably require more than the ordinary daily application, but this will greatly depend upon the state of the weather, etc., and manure water may be given frequently with advantage, particularly when the pots are rather full of roots. Never allow the plants to suffer through want of pot room, at least until they are in their flowering-pots, but shift into those as soon as it is requisite to afford space for the roots. The pots for the final shift should not be less than ten-inch ones, and, with liberal treatment, twelve-inch pots will not be too large. Maintain a moist atmosphere by frequent syringing, etc., and keep the plants close to the glass, affording them a thin screen for two or three hours during the forenoons of very bright days, but this should not be used except the days are very hot, and then only for a short time.

Give a liberal supply of manure water when the pots get full of roots, and syringe frequently, so as to have the plants in vigorous health, and perfectly clean when they commenced flowering. Any airy, light, cool situation will suit them while they are in them, and all the attention they will then require will be to remove the seed-pods as they appear, leaving a few on the most esteemed varieties, to afford a supply of seeds, keeping them clear of decaying flowers, and giving a liberal supply of clear, weak, manure water. Plants for late flowering should be grown in a pit or frame, where they can be treated almost as if in the open air, merely using the lights to protect them from heavy storms, or to slightly screen them when newly potted. Persons, however, who cannot afford space in a frame or pot, will find the following treatment to produce first-rate specimens. Supposing the plants to be well-established in five-inch pots about the end of May, prepare a gentle hot-bed large enough to place them upon after shifting into the flowering-pots. Remove them to this, and inure them to the open air by sheltering them from the direct rays of the sun, etc., for a time, then shift into flowering-pots, and replace them in the open-air hot-bed, and if this is covered with old tan, sifted coal-ashes, or any material that will permit the pots to be plunged about half their depth, or more, according to the temperature of the bed, it will be of great service in preventing rapid evaporation, and affording a regular temperature to the roots. If the pots are plunged, the roots will be apt to strike down into the bed, but this must be prevented by frequently turning the pots round; so circumstanced, the plants will be found to grow very rapidly, producing short-jointed, robust shoots, and they will grow to any reasonable size in a comparatively short time.

The bed should, of course, be put up in a sheltered corner, where they will not be liable to be blown about by wind, and it may be advisable to afford them the support of a stake.

The soil for the Balsam can hardly be too rich; it should consist of about two parts nice friable turfy loam, and one of two-year-old cow-dung, with a sprinkling of sharp sand, well incorporated with it before using.

PASSIFLORA KERMESINA.



ALTHOUGH Passion flowers cultivated in pots and trained on trellises cannot be managed so as to exhibit the graceful elegance for which the genus is so much admired, when grown under more natural circumstances, yet some of the delicate varieties, and this one more especially, may be easily trained so as to induce them to assume a very pleasing appearance. This species is, moreover, a very free bloomer in a small state, producing a profusion of blossoms which, for brilliancy of colour, are hardly surpassed by any of the more robust growers. It is thus very suitable for those whose accommodation is limited. If healthy young plants in six-inch pots are procured at once, placed in a moist growing temperature, and kept growing during the present autumn, till they have become well-established in eight-inch pots, they will form good-sized flowering specimens during the coming season. As early in autumn as the plants shall have filled their pots with roots, and made a moderate growth, remove them to a light, airy situation, where the night temperature may average from 45° to 50° , and supply water to the soil sparingly, in order to get the wood well ripened. As soon as this is effected, cut back the shoots rather closely, and after this, until it is wanted to start them into growth, give no more water at the root than will suffice to prevent the soil from becoming powdery dry, and during this period the plants will be perfectly safe in a warm part of the greenhouse.

Early in February, or as soon after as convenient, remove them to a light part of a pit or house, where a nice growing temperature is maintained; and if a gentle bottom-heat is at command, this will greatly assist in starting them into vigorous growth without loss of time. Give sufficient water to the soil to bring it into a moist healthy condition, and sprinkle the plants overhead frequently, to induce them to break close and freely. When the roots get into an active state, it will be necessary to give a shift, and see that this is done as soon as it is required, otherwise weakly growth will be the result of allowing them to remain in small pots in bottom-heat. Stop any shoot that may take any decided lead of the others, and continue this practice until the specimen is well furnished with healthy shoots of about equal strength, after which the trellis should be applied, and the shoots kept regularly tied up until it is nicely covered, after which the ends of the shoots may be allowed to hang down loosely. A vigorous-growing young Larch plant, with branches left on, makes a very suitable support, but where proper wire frames can be procured, these have a neater appearance, and

are much more durable ; but whatever the kind or form of trellis used may be, it should be applied before the shoots make much progress, as allowing them to grow without support, and clinging together in clusters, tends to produce long-jointed useless wood.

Plants continued in bottom-heat during spring will make great progress, and some attention will be requisite to prevent too rapid growth, as the temperature required by many plants at this season, would be injurious to this Passion-flower, and unless the temperature can be kept about 60° or 65° by fire-heat, it will be better to remove the plants to a cooler situation as soon as they are fairly started into growth.

With careful after-management, they may be shifted into their flowering pots at once, but in most instances it is more convenient to give a second shift when required. To have large handsome specimens, the last shift for the season must be into a fifteen-inch pot, and this should be done before roots become matted, or plants suffer from want of pot-room. When the trellises are well covered with young wood, the plants may be induced to flower at almost any time, by merely allowing them to become rather dry at the root for a week, and then giving a liberal supply of water, or removing them to a cooler house for a short time, and replacing them in a warm moist temperature, will have the same effect ; and sometimes they will bloom freely, without any particular management. By the time they have done blooming, they will be making fresh growth, and if placed in a moist growing temperature, cutting back the shoots to the young wood, and encouraged with manure water in a clear weak state, there will soon be sufficient wood to afford another crop of flowers, and in this way the same plant may be had in bloom three times in one season. The flowers will remain longer in perfection, and attain a higher colour, if the plants are removed to a close part of the greenhouse while they are in bloom. After allowing them a season of rest, as directed for last season, they may be turned out of the pots, reducing the balls, so as to remove all unhealthy soil, and repotted in as small-sized pots as convenient ; and afterwards placed in heat, and carefully watered, until they start into growth. By thus reducing the balls, and cutting the shoots closely back every season, they will last any number of years, and old plants will be found to flower more freely than young ones. Any rich, light porous soil will suit them ; I use light turfy loam, and good rich turfy peat, in the proportion of three parts of the former to one of the latter, breaking it up rather fine, and adding a liberal admixture of sharp silver sand, lumpy bits of charcoal, or small potsherds. Short-jointed bits of the young wood planted in sandy peaty soil, covered with a glass, and afforded a gentle bottom-heat, root freely, if selected before they get too hard.

ON GATHERING FRUITS.

BY A SUBSCRIBER.



THIS is a most important point to be attended to; for upon the manner in which fruits are gathered depends the success of their keeping, in whatever manner they may be preserved. No fruits should be gathered when dew is upon them, or in dull, cloudy weather. On this important point every gardener agrees. I cannot too severely condemn the mode of gathering the more common fruits, as apples and pears, at one sweep; although a common practice even with the best of gardeners, it is a bad one. All fruits should be gathered as they arrive at maturity, and that in the most careful manner. It, however, often happens, even in the most congenial climates and situations, that a portion of the fruit of the same tree, and even of the same branch, will arrive at maturity some time before the others, the ripe portion should be gathered immediately, and carried carefully to the fruit-room, which should be cool and dry. Here they may be laid upon the shelves, or tables, as the case may be, and covered over with canvas, to prevent evaporation, and to keep the dust from settling upon them whilst the remainder is gathered, when the whole should then be immediately packed for preservation. There have been many plans recommended for gathering the more delicate fruits, of which I entirely disapprove. What I would recommend is to gather them by the hand in as careful a manner as possible, and lay them gently in baskets, previously padded, and lined with some soft material, such as wadding, and carried without delay to the fruit-room; the shelves should be previously covered with canvas, or some such material. In good gardens, I would recommend that the fruits which are in any way difficult of being detached from the tree should be cut off the twigs with a pair of sharp scissors, into a padded basket held beneath for their reception. This may be considered to be a tedious way of gathering fruit. I grant it is. But if we consider, we will see that the fruit thus carefully gathered will repay the trouble by keeping longer fresh and sound. I can boldly assert that there is more fruit injured by improper gathering and storing, than by any other means. In proof of this, if gardeners would take an apple or pear which has been gathered in the usual way, and lay it aside for a day or so, then carefully peel it, they will find it bruised, though not observable before. How does this happen? I answer, that it occurred during the operation of gathering, carelessly laying them in cane baskets, and in carrying them to the fruit-room; they are also hurt in moving them from one shelf to another. It is a general practice in large gardens to intrust the gathering of fruits to persons who are regardless how they gather them, and this is a source of much mischief, as the fruit is often much injured by them. It was a common practice (and in some places now) to allow the fruit, when ripe, to fall of its own accord, and many plans have been adopted to prevent the fruit from injury by falling on the ground. Fruits allowed to remain on

the trees till sufficiently ripe to fall of their own accord are much too ripe for preserving for any length of time. Some fruits, such as peaches, plums, etc., will not keep over a day or two; and the flavour of the fruit thus allowed to fall will be much deteriorated. There are certain criteria, by which we may know with great nicety when fruit is in a proper state for gathering. Most fruits, such as peaches, pears, and plums, part freely from the tree when ripe. Plums should be handled in the most careful manner, otherwise the bloom will be rubbed off them. When this is the case, a little fine flour should be carefully dusted over them, but with the greatest delicacy. Apricots should be gathered when the side next the sun feels soft, which may be ascertained by a gentle pressure with the finger. This fruit adheres firmly to the trees, and would, if not gathered, remain until it was over-ripe, and had become mealy.

Peaches, nectarines, apples, and pears, fall of their own accord when fully ripe; but they should never be allowed to do so, for reasons before stated. The best plan is to gather all fruits, with the exception of stone-fruit, sometime previous to their arriving at maturity, to place them in a warm room to accelerate their ripening, if they are required for immediate use. A good criterion with apples and pears is to cut up a fruit of average ripeness, and if the seeds have acquired a brown or black colour, they are in a fit state for gathering; but if they remain white, the fruit is not ripe, and should remain sometime longer on the trees, even supposing a slight frost should intervene. Some sorts of pears and apples which have had a slight touch of frost are not injured by it; on the contrary, they will be found to have acquired a fine flavour. If severe frost should set in before the late sorts of apples and pears on the walls (which in some cold and unfavourable climates will be the case) have arrived at proper maturity for gathering, they should be covered by suspending canvas or bunting in front of them. Having procured the proper materials, and cut or sewed them into convenient lengths, they should then be fastened on the top of the walls by means of hooks and eyes of sufficient strength, and to pegs driven into the ground at two or three feet from the wall; this covering should always be taken off during the middle of the day, and replaced in the evening; by this means they can be allowed to remain on the trees much longer, free from frost. If apples have been pitted in the manner previously recommended, and if very severe frost should occur, the pit should on no account be opened if there is the least suspicion that the frost has reached them; if it is opened, air will enter, and the consequence will be the entire loss of the fruit. When the frost has disappeared the pit may be opened with safety.

CHERRIES.—This fruit should be gathered when quite ripe. I, however, would recommend a portion of them to be gathered before being quite ripe, and if required for immediate use, they should be suspended over a hothouse flue in a basket in order to accelerate their ripening. The remainder may be kept in air-tight tin cases, of a broad and flat form, packed in a little fine dry charcoal, beech-flowers, or bran, until they are required for use.

STRAWBERRIES AND RASPBERRIES.—For these fruits, as far as I am aware, there has been no means adopted for their preservation for any length of time. I would recommend that the fruit that has begun to change colour (which some will do before others) should be gathered, and placed in a hothouse to accelerate the ripening; this will afford a succession. Fruits gathered in this manner and surrounded with silk paper, and then packed in tin cases, thoroughly air-tight, with a little charcoal sprinkled amongst them, will be found to keep for some time; the later sorts of these fruits should only be preserved. The flavour of these and other fruits of this nature, which have been preserved in this manner, will not be so fine as those that are allowed to remain on the plants and ripened by the sun. However, fruits preserved in this way will be found useful for dessert, when those in the open air are finished.

WALNUTS, CHESTNUTS, FILBERTS, ETC., should not be gathered until they are quite ripe, and fall of their accord from the trees. It will often happen, however, in late seasons, that the winter will be far advanced, especially before chestnuts drop, therefore they should be gathered by means of ladders; but on no account should the trees be beaten with sticks, which is a very common practice, but cannot be too severely condemned.

After they are gathered they should be divested of their outer shells, and gently dried, after which they may be packed in boxes or casks, in fine dry sand or charcoal, in alternate layers, and placed in a dry cellar. The casks or boxes should be elevated on bricks, to prevent rats and mice from destroying them, which will be the case if they once gain admittance.

PACKING FOR CARRIAGE.—This is also an important point to be attended to, especially when over-ripe fruits have to be sent to any distance. In this, as in preserving and gathering, different methods have been adopted, and a great many of them without success. Baskets, for packing fruits, should on no account be used if it can be avoided. I would recommend two boxes, to be of different sizes, with false bottoms, and secured with a lock, and two keys—the one to be kept by the person who packs the fruit, and the other by the person who unpacks it. Boxes made of inch-deal have been recommended by some. These will answer the purpose equally well, if they have been made thoroughly air and water-tight. In packing fruits of all descriptions, the heaviest should always be laid on the bottom, and the more delicate on the top, each fruit being previously surrounded with clean linen or fine paper, and packed amongst bran, beech, or hazel flowers; fine powdered charcoal, will answer equally well, if it has been thoroughly dried previous to being used. Whatever material has been made use of for packing, when the fruit is taken out of it, should be properly cleaned, and laid in some cool cellar until required for use, first taking all bruised ones out and throwing them away; for, if they are left, they will impart a musty flavour to the others.

For packing grapes, I would recommend bran, thoroughly dried, first putting in a layer of bran, then grapes, shaking a little amongst the berries, which will fill up any spaces between them, and likewise

prevent them from bruising each other. When unpacked, the bran will fall out from amongst them, and if any remain, it should be removed with a small painter's brush. The berries should then be treated as before directed, when they will be ready for the table. The smaller fruits, such as gooseberries, currants, etc., should be packed in flat tin cases, and on no account should a large quantity be put into the case. If this is done, they will not be fit for use at their journey's end. All these small fruits should be packed in bran, which can be easily removed when they are unpacked. This will prevent them from bruising one another. When unpacked, they should then be laid in some cool apartment until they are required for use.

FORCING STRAWBERRIES.

BY A CONTRIBUTOR.



THE time has now arrived when every gardener who forces strawberries will have commenced potting the runners, in order to make good plants of them for early excitement. Perhaps a few observations on their culture in pots, by one who has had ample experience, may not be out of place.

I would have it understood, however, that I do not regard the system I advocate as anything new; but I am convinced that the plan is everything which a good and successful plan ought to be, if care is taken to carry it out well.

The soil I have seen used, and that, too, attended with the very best results, was brown, fibrous loam which had been taken from a pasturage. The top spit only was taken off to the depth of about three or four inches. It was used immediately afterwards, in as green a state as possible. When used in this state, it was said to contain more of the constituents of plants, more alimentary matter, and other organic substances most desirable to produce a healthy, vigorous action of root. It was used in most cases chopped up rough, almost as large as we could get it into the pots. Decomposed horse-dung was used at the rate of one barrow-load to two of loam. If the soil was too stiff, it was corrected by the addition of sand or sandy earth, or lime rubbish, or bruised charcoal. The plan of putting the runners into three-inch pots is undoubtedly the best. If potted otherwise at the first onset, in six-inch or larger size pots, the soil becomes deteriorated, exhausted, and deprived of its organizable matter, through the constant application of water. In choosing the runners for potting, we always selected them from plants which had been forced, experience having revealed to us the fact that those runners which were taken from plants which had been forced came into bearing sooner, and not only that, their fruit was larger. As soon as the runners have filled the three-inch pots with roots, they are separated from the parent plant, and potted

into the sized pots in which it is intended they are to remain, in six-inch, eight-inch, or nine-inch, as the case may be. They are then placed on ashes in beds, with alleys for convenience in watering and taking off runners.

Mr. Turnbull, who forced 2,000 plants annually at Blenheim, used to pot a quantity in nine-inch pots; they did admirably, three in a pot. Potting in nine-inch pots possesses many advantages over the old plan—such as a saving of room, etc., and they do not get dry so soon as small pots, consequently the roots are preserved.

I recollect Mr. Turnbull sent some plants, well fruited and staked out, to the dessert table as they were grown. Those who witnessed the plan of potting in nine-inch pots were unanimous in approving of it most highly, both for productiveness and good economy. During the growing season the plants are inclined to make runners, which should be closely watched, and, as soon as they make their appearance, cut or pinched off. It is a good plan to go over the stock every three days. As regards watering, great care is requisite on the part of the cultivator never to allow the plants to flag for want of water; water should be supplied copiously in hot weather. I have known the time when we were obliged to water two or three times a day during hot weather, otherwise the plants must have suffered from drought; hence they become unhealthy and unproductive. It was customary to water with deer or sheep-dung diluted in pond water twice a week. The first 500 plants were potted the first week in July, if it were possible to get them, in order to get fine plants fit to introduce into the forcing-pit the first week in December. Before introducing the plants into the forcing-pit, a bed of fermenting material was put in, composed of half-spent dung, or leaves from the linings, or otherwise. This was to excite the roots gradually into a growing state, which both strengthens the root and accelerates the growth of the plant. When the temperature of the bed had sunk to a moderate heat, the pots were put in and half plunged. In October, before the frost came, those plants which we did not intend to force early were stored away in spare frames or pits, plunged to the rim in old tan, or ashes, or soil, till required for excitement. Some were stacked in ridges running from north to south, in ashes; on the top of the ridge was placed boards, to prevent wet getting to the roots and pots. In very severe weather dry litter was thrown over the ridge, thus preventing any serious injury to the roots by the action of frost or the impulse of sharp winds. Those plants which we begun to force had no more water than was necessary, till we could perceive the bud had begun to expand, or in cases where the plants were very dry. Every forcing gardener knows how important it is to be sparing of water to strawberries early forced in pots. Much care is requisite on the part of the cultivator to keep the soil sweet; for, if it happens to sour through overmuch moisture, the result is a failure. We began with a temperature of 48° night heat, allowing 12° or 14° of maximum of heat during day. Special care was taken not to fire higher for a few weeks. As the plants progressed in growth, the temperature was gradually raised according to the stage of their growth. When

August.

the trusses made their appearance, they were removed to another division; here great attention was paid to the aëration, admitting air at every opportunity till set. The atmosphere of the house must be kept as dry as possible while the plants are setting. It is a good plan to use camel-hair pencils for fertilizing the plants. This should be done in the middle of the day. I have seen them fertilized by using a pair of bellows, which answers the purpose very well. When it is discovered that the fruit is set, the plants are benefited by a rest in a low temperature for five or six days. When I say a low temperature, I do not mean lower than that in which they have been while the fruit was setting. A temperature of 60° night heat, with a rise of 10° or 12° during day, will be found adequate to the welfare of the fruit. They will vary little in this heat, consequently they have time to complete themselves, which they, of course, could not do, if placed in a high temperature to swell them off (as some people imagine) quickly. If placed in a high temperature immediately they are set, it is many chances to one if they perfect a single fruit. They are one-sided generally. In all cases success depends on patience, perseverance, a good deal of sound judgment, and a great deal of carrying and moving to and from of pots. To have strawberries ripe the latter end of February, the gardener must be in attendance early and late.

CULTURE OF THE PANSY.



THE following instructions may be useful to amateurs beginning to grow this flower for the first time. Having fixed upon your situation for your bed (one having a south-eastern aspect, and well sheltered from all winds is the best that can be selected, taking care that it is not so overhung with trees as to cause the plants to be drawn, or where they will catch the drippings from the boughs), at any time between October and February mark out your ground in plots, three or four feet wide, with one foot alleys, remove the soil from the beds to the depth of eight inches, and fill them to the height of three inches above the alleys with previously prepared compost, the roughest or coarsest portion of which should be made use of first, reserving the finer parts for the surface.

The next operation to be considered is planting; for this choose a dry day, towards the latter end of March or the beginning of April, and having first neatly raked the bed, proceed to mark off the intended rows at one foot apart, and when planting leave a space of at least ten inches between each plant. After planting it would be advisable to turn a garden pot over each plant for the first day or two, to shade it from the sun, wind, or frost. If there has been frost during the night, be very careful not to uncover them if the sun be at all likely to shine. Pansies love a moist, still atmosphere, and are very impatient of wind; all sudden changes are also very prejudicial.

Several of your readers will have remarked that if a hot sun succeed rainy weather, many of the plants begin to droop, and would soon die off if not shaded. The same effect is also produced when a bed previously shaded is suddenly exposed to the heat of the mid-day sun. If you find any plant thus affected, place a hand-glass over it, and form it into cuttings. But after all due care and attention have been bestowed, it will frequently be found that some of the plants fog off. This has been attributed to the wire-worm, but I have never found that pest at or in the roots of any pansy I have taken up, which I invariably do when any of the plants fall prostrate. Strength or freshness of the manure, and its being too retentive of moisture, have been assigned as other causes; that this disease has been accelerated by them I have no doubt, but it cannot be the only reason, as they very frequently fog off in poor sandy soils. Perhaps some of your readers can suggest the true cause. Any person who may wish to send flowers for exhibition will be quite unable to compete successfully, unless he covers his beds at least a week previously to each show, to protect the plants from being battered by the wind or rain, or faded by the sun; in hot weather it will prevent excessive evaporation, and in cold keep the temperature more uniform. The frame for the cover should be at least three or four feet above the bed in the centre, and supported at the four corners on posts at about eight inches from the surface, to allow the free circulation of air; it may be made similar to a tulip frame.

One of the greatest enemies the pansy-grower has to contend with is the slug; during one night it will make as great ravages among the blossoms as will require a week to replace. The best method to rid yourself of these intruders is to water the bed with clear lime water during the evening, after a shower of rain (when they come out in great abundance); but any person wishing to show, must carefully search for them both morning and evening. They generally secrete themselves under the leaves or close to the roots of the plants. In order to guard as much as possible against depredations of slugs, etc., let your beds be edged with slate or stone, which affords no harbour for them, and always looks neat. There is only one other remark I would wish to make concerning the general management of these plants, namely, never to water your beds even in the driest season, but in its stead, if continued hot weather is expected, I will advise that fresh cow manure be placed round the base of each plant, which, by preventing too rapid evaporation, will be amply sufficient to preserve a due amount of moisture about the roots. For the propagation of old and known varieties about the middle of this month, take strong short-jointed cuttings from those plants which are the healthiest and have produced good flowers during the season, and strike them in a shady bed, made of equal parts of silver or sharp sand, leaf-soil, a little bog earth, and garden mould; for the first few days they should be covered with a hand-glass, and shaded from the sun, but no protection will be required afterwards. When the cuttings are sufficiently rooted, which will be in about three weeks or a month, plant them

in good-sized pots, and let them stand in a dry situation till the frost commences; the pots should then be plunged in cinder ashes in a cold frame, and kept quite dry, but air must be given as often as practicable, particularly in spring.

When frost is severe, cover the frame with a mat, which must not, on any account, be removed during the day if the sun shines; more plants are lost in the spring, especially by not attending to this rule, than by the severest frost. New varieties of course must be raised from seed, which may be sown at any time from March to September, either in pans or in the open ground. In about six weeks the seedlings will be ready to plant out, but if sown so late in the year that they cannot be removed, the seedlings will require some protection during the winter, either by a frame or otherwise; they can be planted out early in spring. As a general rule, pansy seed should be sown as soon as convenient after being gathered; for if allowed to remain some time unsown, vegetation is much longer in taking place, and many of the seeds will not come up at all. Seed should be saved from those plants which have the best shaped blooms; and if these be fertilized with the pollen of other flowers, which have bright or good eyes, it may have a good effect. The seed-pods when ripe become erect, and open on the first fine day, and if not gathered, would shed in the course of a few hours during fine weather; therefore the beds should be looked over at least once a day, and such pods as appear ripe should be gathered. It only remains to notice succession beds, which it will be necessary to have, in order to ensure a continuance of bloom; for this purpose I would recommend that the first cuttings which can be obtained be taken from the spring plants, and, when struck, be planted out in a bed, to bloom in the autumn. The treatment of the plants will be the same as before directed, but the situation of the bed must be due south. I may add, that the whole of the remarks I have just made are the result of several years' practical experience in the cultivation of this plant.

POT CULTURE OF SCARLET PELARGONIUMS.



THIS, though so common in all collections, from the windows of the poor man to the conservatory of the wealthy, and, withal, so brilliant and showy an ornament, is rarely seen in the perfection to which, by judicious culture, it may be brought. I have produced most excellent specimens of it by the following mode of management:—About the middle of July I select healthy plants, having from two to six shoots of young wood, as close to the pot as can be obtained, and set them in a sunny situation. I give them little water for a fortnight; at the expiration of that period I cut them down, leaving about two eyes of the old wood. I then set them in the shade, and water sparingly until they have broken well, which they will have done in about three weeks. I cease watering them

then for two or three days, and, when thoroughly dry, I shake them out of their pots, trim in any straggling roots, and re-pot into as small pots as the roots will admit of, shaking the mould well in among the fibres. When potted I set them in the shade, and give them a good watering, to make the soil firm; afterwards I water sparingly, until they have begun to grow freely, when they require a more liberal supply, especially in dry hot weather, when they may be watered twice a day all over their leaves, from a fine-rosed pot.

In about a week or ten days' time, I remove them to a situation where they are exposed to the full influence of the sun during the greater part of the day. When they have well filled their pots with roots, they are shifted into others, two sizes larger than those in which they are flowered.

About this stage of their growth care is especially taken to rub off all young shoots except one or two on each main branch, and these should be as equal in size and strength as possible all over the plant, in order that they may all flower at the same period, which they will do, or nearly so, provided too many be not left on the plants; and, as large trusses of flowers are more attractive than small ones, though there may be double the number of the latter, it is necessary to encourage the strongest and healthiest shoots only. I should say for a plant in a six-inch pot, two shoots would be sufficient to leave; for one in an eight-inch pot, three or four; and for one in an eleven-inch pot, from four to six, the grand point being, as before stated, to get all the shoots left on the plants to bloom at the same time. The trusses will keep in perfection for a month or six weeks. A strong one-year-old plant, with a single stem, flowered hydrangea-fashion, presents a brilliant appearance. In staging the plants for the winter, I place them as near the glass as possible, and give no more water than merely keeps them from flagging. About the beginning of February they are introduced to the forcing house, and placed where they can receive the greatest amount of sun. They there require an increased supply of water; and when they have commenced growing vigorously, and while throwing up their flower-trusses, they like a copious supply, in bright dry weather sometimes twice a day, gently syringing the foliage and flower-trusses with a fine-rosed syringe, morning and evening. Liquid manure made from sheep's droppings, applied two or three times a week, adds much to the strength of the truss and to the beauty of the foliage; but this should not be applied till the trusses have made their appearance. As soon as these can be plainly distinguished from the points of the shoots, the latter must be carefully nipped off, immediately before them. The flower-stalks will then take the lead and grow most vigorously. A stick will be required for each shoot, but it should not show above the foliage; the flower-stalk will be sufficiently strong to support the truss. Soon after the shoots are stopped, they will send out laterals. These should be picked out with the point of a knife on their first appearance, in order that the whole energy of the plant may be directed to the main shoots and flower-trusses. By the middle or end of May, plants treated as above will be in excellent order for the con-

servatory, and when placed there it is absolutely necessary to avoid all extremes in regard to watering, or the consequence will be that the foliage will assume a sickly hue, and prematurely drop off, and the flowers will not be so long-lived as if the soil was kept in a medium condition between wet and dry. When the beauty of the plants begins to fade, they should be turned out to harden off previous to their being cut back in July, being intended for the first blooming in the following May; and the conservatory should be replenished by a batch cut down early in September.

When the latter have broken, are shaken out and repotted, they should be kept as dormant as possible all the winter. In April they must be shifted into large pots, and at once introduced into the forcing-house, where they should receive the same treatment as the former lot. The plants for the third succession must be selected from those cut down in September. They should be introduced into the forcing-house in April, along with the others; they should not be shifted then, but stopped back, and when they have broken they should be shifted, and afterwards treated in all respects as the former lots.

The soil which I use for my plants consists of equal portions of rich friable loam, leaf-mould, and well-decomposed cow-dung, mixed with coarse silver sand and lime rubbish to the amount of about one-eighth of the whole. These should be well incorporated with a spade, but not sifted. For large plants especially, ample drainage is essential—say a few oyster-shells, and over these an inch in thickness of the rough siftings of old lime rubbish, then a layer of flaky hot-bed manure. I would here remark that during their earlier stages of growth, the soil should not be of so forcing or heavy a character as for more advanced plants. I mean it should contain more sand and less dung.

MANETTIA BICOLOR.



HERE are many plants in cultivation, which, during the short period they are in flower, have a much more striking appearance than this; but I scarcely know one which surpasses it in continuance and profusion of blossoms, or is so accommodating in habit. Being easily propagated, and forming good-sized specimens in one season, it is advisable to keep up a stock of young plants, which occupy less room and are generally more satisfactory than large ones kept after blooming. Short-jointed rather firm bits of young wood, planted in sandy peaty soil, covered with a bell-glass, and afforded a gentle bottom-heat, root freely, if properly supplied with moisture and guarded from damp; and they will probably be ready to pot off in the course of a month or so. After placing them singly in small pots, set them in a close, moist, rather shady situation, until they shall have become established in their pots; and as soon as that is the case, accustom them to a free circulation of air and full expo-

sure to sunshine, in order to induce a close, thick habit of growth. Cutting roots early in spring, placed in a moist pit or house, supplied with pot-room as may be necessary, and kept rather warm, will make nice stocky plants in nine-inch pots in the course of the summer; and if kept growing gently during the winter in a temperature of from 50° to 60° , and shifted into their flowering pots early in March, and retained in a nice moist growing temperature of, say, 55° or 60° at night, allowing it to rise some 10° with sunshine before giving air, under proper management, will form large specimens, and bloom abundantly from early in June till late in autumn. This plant never flowers with much effect until the pots are tolerably full of roots; therefore, manure water should be given frequently during the blooming season, which greatly assists in maintaining vigorous health and prolonging the period of flowering. While they are in blossom, the plants should occupy a situation where they can be kept sufficiently close to induce a little growth, and the warmest part of the greenhouse will be found sufficiently warm during the summer to effect this object; but it will probably be necessary to remove them to where they can be assisted with a little fire-heat when cold cloudy weather sets in in autumn. Let the object be to keep them growing very slowly, and with moderate convenience this will be easily effected.

Plants, however, that have bloomed during most of the summer, will become less attractive than younger specimens, which should be prepared for winter flowering, so as to have them ready to shift into their blooming pots early in June, and to be kept in a moist growing pit during the summer. A cold frame or pit may be so managed as to form a very suitable situation for the growth of the plant at this season, and a pit where the aid of a gentle heat from a dung-lining can be obtained, is the best possible place for growing the plants during the summer. They should be removed to a light airy part of a house, where the night temperature is maintained at about 50° , and sparingly supplied with water until they commence blooming, if this should be necessary; but it will seldom be necessary to resort to means to induce plants to produce blossoms that have been some four months in their flowering pots. Plants thus prepared, if afforded a light situation, and a temperature of from 55° to 65° , will bloom abundantly throughout the winter and spring months. It will, however, be necessary to water with care, and to use every means to maintain the specimens in a healthy state, giving manure water in a clear, weak state, if the plants appear to require it; but those in vigorous health will flower more abundantly without the application of this stimulant.

I am not partial to the use of trellises for plants where they can be dispensed with, and this *Manettia* may, with timely and continual stopping, be trained to stakes in the form of a dense compact bush, which, to my taste, is much handsomer than where trellises are employed. If it is intended to keep specimens that have bloomed for further use, they should be removed to a rather cool, airy position as soon as they become at all shabby; be cut back rather closely, well thinning out the shoots; and before starting

them into growth, the balls should be considerably reduced, so as to allow room for a supply of fresh soil, and a liberal allowance of manure water should be afforded them as soon as the pots are moderately filled with roots; but it is better to be provided with young plants, and to throw away those that have bloomed one season. Good turfy peat and turfy sandy loam, in about equal proportions, broken up into small pieces, and well incorporated with a free admixture of sharp sand, form a suitable compost for this plant; but where peat is scarce, leaf-soil may be used instead.

HOYA BELLA.



TO have this charming little *Hoya* in perfection, it requires plenty of warmth and moisture while growing, good drainage, and a free, open soil. The latter should consist of equal parts of good fibrous peat, leaf-soil, and sand, well mixed together, to which may be added a tolerable portion of clean potsherds, broken small, and a few pieces of charcoal. The pots used should be drained from one to two inches in depth, according to their size. The peat should be broken up with the hand, but not sifted. Presuming that young plants are obtained in spring, they should be placed in a stove or pit, where a temperature of from 65° to 70° is kept up. Under such circumstances they will grow freely, and will soon require shifting into larger pots.

Shade slightly during bright sunshine, and water when necessary; but with a sufficiently moist atmosphere, and a moderate use of the syringe on favourable occasions, but little will be required at the roots, heavy drenches of water being prejudicial to them. As they progress, the leading shoots should be stopped, in order to induce the formation of more numerous branches, which should be spread out and arranged so as to make a neat specimen. If by the middle or end of June the plants are still growing freely, another shift may be given, and the same temperature maintained. When they begin to cease growing, which they should be encouraged to do early in autumn, they should be placed on a shelf near the glass to ripen their wood, and a drier atmosphere should be maintained; they may be kept here during winter, provided the temperature is not higher than 55° or 60° ; during that season just sufficient water will be required to preserve the foliage in health. Early in January, or a little later, as may be convenient, the plants should be cleaned, top-dressed, and placed in a growing temperature as before directed, keeping the atmosphere moist, to induce them to break freely. When they have broken well, if large plants are desired, they may be shifted and grown on; but if intended for flowering, it is preferable to defer shifting, as they bloom most freely when slightly pot-bound. The flower-buds will make their appearance as the young shoots progress, and when commencing to expand, a drier atmosphere, and a somewhat cooler temperature will prolong the

duration of the flowers. If well attended to during the summer, the wood will be perfectly ripened by the time the flowering is over, and the plants may be wintered as before. If it is necessary to prune them back it should be done a few weeks before starting them, in order to allow time for the wounds to heal over before growth has commenced. This plant has a fine effect, either planted out or plunged in a basket of moss, and suspended from the roof of a stove or orchid house. In this way the flowers show themselves to advantage; and if the plants are kept moist while growing, and otherwise well treated, they will last for several years in perfection. Cuttings made of the young shoots root freely; insert them in sand, cover with a bell-glass, and place them in a temperature of 70° , where there is a gentle bottom-heat. When rooted, pot them off singly into two or three-inch pots, and place them in a close, warm situation; if rooted early they will make strong plants by autumn.

THE FUCHSIA.

BY A SUBSCRIBER.



IN cultivating this useful flower, I begin by striking the cuttings about the end of this month, using silver-sand and leaf-mould for the purpose, and placing them in a close frame or pit, where there is a little bottom-heat. When the sun shines, I shade for four or five hours during midday; and, after the cuttings have been in for three or four days, I pull off the light for ten or twelve minutes every morning, in order to allow the confined air and damp to escape. As soon as they are rooted, I pot them off into three-inch pots, in a mixture of equal parts silver sand and leaf-mould. I prefer that mixture for the winter potting, for, being light and porous, it allows the water to pass off quickly. When potted off, they are replaced in the frame or pit; and, as soon as they become established, I remove them to a warm and shady part of the greenhouse; after hardening there for a week or two, they are removed to a more airy part of the house, where they remain until January, when they receive a little artificial heat, say from 40° to 45° during night. When the roots make a fresh start, I shift them, some into five-inch pots and some into a size larger, according to the strength of the plants, using a mixture of equal parts silver-sand, turfy peat, and leaf-mould. In February they should have from 50° to 60° of heat during the day-time, and from 40° to 50° during night. As the day lengthens, I increase the day temperature to from 60° to 70° , the night heat being about 5° less, maintaining a moist atmosphere at all times, with air both day and night when convenient. The plants should be kept as near the glass as possible, and should be shaded during bright sunshine. If they do well, they will require shifting about once in five or six weeks, and before the operation the mould about the roots should be rather dry than wet. After they are shifted,

August.

give a good watering, and replace them in their old situation, keeping them close for a day or two. In shifting, be careful not to break the ball, for if that is done it is a long time before the plants recover, and then it is ten to one if ever they make fine specimens.

In potting, I drain well and place some moss (*sphagnum*) over the crocks, then some of the roughest of the compost, which (after the January shift) consists of one part silver sand, two parts turfy or fibry peat, and one part dry cow-dung, all well mixed together with the spade, and used without sifting.

When I resided near London, I used mould from Wimbledon Common with as good success as the above mixture, but as yet I have found no such mould to equal that in this locality. As the season advances, I pot rather firmly, and I find it a very good plan to put some of the moss on the top of the soil; when potted, the roots seem quite at home in it, and it prevents the mould from being washed over the pot. I use rain water both for the soil and for sprinkling the plants overhead with. In the latter operation I am guided by the weather, and in the former by the wants of the plant. I also water about once a week with manure-water, not over-strong. I train on the single stem system, allowing them to branch out right and left, never pinching the side-shoots back, except when one seems to take the lead of the others. By following these directions, I am certain that every success will attend your labours.

THE SEED OF RUNNER BEANS.



CARE should be taken in saving the seed of runner beans, for it generally degenerates very much with those who save it from year to year, the usual practice being merely to trust those pods for seed which happen to escape in the picking. To preserve this seed properly, a few runners should be especially reserved for seed, and left untouched, as the first pods formed are generally the finest, and they get well ripened before the season closes; whereas if the first pods are used for the table, it is only the later that can be used for seed, and these are never so good as the first. Hence the seed gets smaller every year, and the plants cease to be so prolific or to produce such good pods.

REMINDERS FOR GARDEN WORK IN AUGUST.



EARTSEASE.—Still propagate by cuttings, and plant out seedlings.

PELARGONIUMS that have been in may be taken out of their large pots, root pruned, and put into smaller.

PINKS.—Plant out the struck pipings into nursery beds for moving, or into their permanent beds for flowering; rich loam and dung will make the best soil.

STILL propagate all sorts of half-hardy clump plants, such as fuchsias, petunias, verbenas, etc., by cuttings, and all kinds of perennials by parting the roots or cuttings.

ALL biennials that are large enough should be planted out on beds, or where they are to blossom. Canterbury bells, two years' stocks, wallflowers, sweet williams, seedling pinks, picottees, carnations, polyanthuses, etc.

DAHLIAS require the ordinary care of fastening the shoots, shading the flowers, cutting away such leaves or branches only as are in the way, or shoots beyond the flowers wanted. If there be a finer bloom than usual on a desirable variety, mark that flower for seed and save it; but if you have any regard for a continuance of good blooms for showing, pull off every flower the moment it is useless; the more blooms there are the worse it is for all. It would be well to go over them daily for no other purpose than pulling off the buds which cannot bring useful flowers, and all those that have gone by.

CARNATIONS, PICOTTEES, etc., not layered, must be done as soon as possible, and those which are layered must be watered and carefully attended to till rooted.

TULIPS.—Throw the soil out of the beds intended for this flower as soon as they are at liberty, and let it lay in high ridges on each side the bed, to be turned over once or twice a month.

AURICULAS.—Cover from too much wet and heat, but give all the air you can.

EXAMINE all the roses budded in June and July, and release them from their ties and cements of clay. Cut off the shoots from the stock, that the whole strength may be thrown into the bud.

STRAWBERRIES.—Cut off the runners from old plants, clean the beds, plant the runners, if wanted, in nursery beds, pots, or new fruiting beds.

DESTROY wasps, flies, ants, etc., near choice fruits; also examine the walls and trees for snails.

VINES must be constantly watched to see that no wood but that which is really wanted be allowed to grow.

SPINACH.—Sow the main crop.

PARSLEY should be rogued, as it is called; that is, every root that has not a well-curved foliage taken out; the rest may be cut down pretty close.

ONIONS that have nearly come to their growth should be bent down to throw the greater share of nourishment into the bulb; so say the market gardeners.

SALADING.—Sow as before if the supply be required, and particularly lettuces to stand through the winter.

LEeks should be earthed up three or four inches to whiten them.

CUCUMBERS should have all the weak and useless shoots pulled off, dead leaves removed, and be shut down in cold winds, and always towards evening. Those out of doors require the same, all but cutting down. The hand-glass should be kept down in heavy rains.

CELERY requires earthing up as it grows; the soil should be broken small and drawn to the stems, but not so high as the heart of the plant.

CABBAGE SEED should be sown for a good crop to come in the spring and summer.

BROCCOLI.—Plant out the last of any or all kinds from the seed-bed.

HOE between all kinds of crops.

BEANS.—Top those in bloom, and earth all up.

IN many other respects, operations should assimilate to the business of last month.

GATHER in seeds of all kinds as they ripen, and keep them from damp.

CAULIFLOWERS, to be protected through the winter, may be sown the third week.

TO CORRESPONDENTS.

ORNAMENTAL IVIES.—*P. B., Nantwich.*—It is probable that you have the plant you want. *Hedera helix lucida* should have large leaves distinctly lobed, the colour is a rich full green in summer, changing to a fine chocolate or purplish bronze hue in winter. The leaves are most highly polished, hence its name, *lucida*, shining. It is commonly known as the Poet's Ivy.

RHODODENDRONS.—*C. B. C., Rotherham.*—The same treatment that was successful with *Azalea* cuttings should be successful with *Rhododendrons*. Success depends in a great measure upon the condition of the cuttings, which should be made from the shoots of the season when nearly, but not quite ripe. Should your cuttings fail, it is probable that you have taken them too early, and that they were not sufficiently advanced.

E. M. W., Clapham.—Your specimen arrived, like most of those which are sent to us by our correspondents for identification, in too dried and crushed a condition for us to give a decided opinion, but it appears to us to be *Chelidonium majus*, the common Celandine.

HOTHOUSE, CONSTRUCTION OF.—*M. A. C., Welshpool.*—Should you wish to have a house erected for you, we should advise you to apply to Messrs. Boulton and Paul, Rose Lane Works, Norwich, or some other horticultural builders, for an estimate; or should you wish for one of home construction, there being so many points to be considered, and so many different methods of construction, we should advise you to consult a good guide, such as Mr. Hibberd's book, "The Amateur's Greenhouse," before commencing operations.

ADIANTUM FARLEYENSE.—*P. B., Nantwich.*—We do not think you will be successful in growing this fern in the situation you propose. All the *Adiantums* require a moist atmosphere, and are liable to be injured by sunshine or drought.

IMANTOPHYLLUM MINIATUM.—*F. B., Bovey Tracey.*—This beautiful plant requires a warm part of the greenhouse, or a cool part of the stove. It grows best in a rich loam with about a third part of sand. When growing freely it requires a plentiful supply of water. The bulbs should be turned out of the pots in autumn, and kept dry until the spring, when they should be potted. Take care that the pots are well drained.

STEPHANOTIS FLORIBUNDA.—*F. B., Bovey Tracey.*—An article on this delightfully fragrant stove climber shall appear in the September number.

NEW LOBELIA.—*Mrs. T. H.*—We can only suggest that you should consult some first-class working florist as to the value of your seedling. As a rule, new plants are only introduced through the regular trade.

PEACH TREES.—*Delta.*—Your plants are evidently attacked by red spider, for which the best remedy is continual syringing. If the fruit was not so near ripeness, a dusting of sulphur would drive off your enemy. All you can do now is to wait till the fruit is gathered, and then supply sulphur.

MORELLO CHERRIES.—*J. B.*—It is probable that your trees have their roots in undrained soil. If so, the remedy is to plant them so high that the roots cannot reach it, unless you can drain the soil better.

MELONS.—*C. C. M.*—After your crop of melons is set, thin out the shoots sufficiently to admit plenty of light and air for the fruit-bearing vines.

LAWNS.—*Alpha.*—Lime acts by encouraging the growth of the best kinds of grasses, which then extinguish the inferior sorts. It especially encourages clover, and such plants. If a lawn is infested with coarse weeds of any kind, lime will not remove them; they must be destroyed by hand.

WORMS IN POTS.—*H. F. G.*—Worms may easily be dislodged from pots in the following manner: Throw a pint of quicklime into a shallow tub full of water, stir it up. Then drop the pots into it so that they are submerged to the brim. Let them remain there for about an hour, and then take them out. Plain water will do, without the quicklime, but the pots should remain immersed a longer time. The plants like the operation, but the worms are all cleared out.





MARANTA ROSEA-PICIA

MARANTAS.



PLANTS with variegated foliage are now in much esteem for decorative purposes, and well they deserve to be so, for many of them are exceedingly useful, being striking and interesting objects irrespective of their flowers; and hence their beauty is of a more enduring character than that of plants which have no particular beauty except while in bloom. Unfortunately, however, the flowers of most of our finest variegated plants are very uninteresting; but this is of little importance, as the beauty of their foliage will always render them attractive and useful for decorative purposes. Several varieties of *Maranta* deserve to be ranked among the finest of our variegated plants, being free growers, with large, finely-marked foliage, which is not so tender and liable to become disfigured by any little mismanagement, as is the case with many of our variegated plants. Persons about to commence the culture of this genus, who can only accommodate a few varieties, should procure the red and white veined kinds, which are very beautiful.

Young plants cannot be procured at a better season of the year than the present, for there will be no danger of injury on the journey while the weather is mild. When received, the plants should be placed in a close but not over-warm house or pit, and kept rather dry for a few days until they get over any little injuries they may have received in travelling. Then examine the state of the roots, and give a moderate shift, if necessary, using nice fibry peat, with a small proportion of loam carefully broken up, and well intermixed with plenty of sharp sand and some lumpy bits of charcoal, to insure the free percolation of water through the mass. Likewise have the pots well drained, for the *Maranta* requires a free supply of water while in active growth; but stagnant moisture about the roots is very injurious, spoiling the markings of the foliage as well as the general health of the plant. After potting, place the plants in a close warm pit or house, where they will not be exposed to bright sunshine, and water carefully at the root until they get hold of the fresh soil; but dew them overhead with the syringe every fine afternoon. If a brisk bottom-heat can be commanded, this will greatly assist in promoting active growth; but fine, strong specimens will soon be obtained without it. When dull, cloudy weather occurs, it will probably be necessary to place the plants in a light, rather airy part of the house, in order to prevent the foliage being injured by damp; but unless damp appears inclined to be troublesome, they may be allowed to remain in the warmest corner, and be kept growing on slowly. Syringing will, of course, be unnecessary in winter, except an occasional wipe on a fine morning, to clear the foliage of dust, etc.; and too much water must not be given to the soil. Attend to repotting in spring as early as may be necessary, giving moderate shifts, which are safer than large ones. If scale or insects of any kind attack the foliage, these must be carefully removed by means of a sponge and water,

and this should be attended to before the foliage gets disfigured. By continuing this treatment for a season or two, fine, large specimens will be obtained; and when this is the case, they may be removed from the conservatory, where, if they are afforded a close corner, and not over-watered, or allowed to suffer from damp, they will be quite at home all the summer season. But they must be removed to where a temperature of not less than 55° is maintained, as soon as cold, damp weather sets in in autumn. Large specimens will, of course, require to be repotted occasionally, and this should be done as early in spring as there may be an opportunity of affording them a brisk temperature to stir the roots. With proper management, specimens will last any number of years; and propagation is easily effected by dividing the old plants, or by means of offsets, which should be taken off with as many roots as possible, and kept close for a few weeks after potting, when they will be sufficiently rooted to be treated as established plants.

Maranta splendida and *M. illustris* present us with leaf surfaces most elaborately and richly painted, and, moreover, very distinctive as fine foliaged plants; and in *M. rosea picta* we have a remarkable example of leaf colouring, the leaves having a bright rosy midrib, with bands of brilliant red and white, the intervening spaces of a solemn tone of deep green.

VALLOTA PURPUREA.



HERE are few plants so showy and useful as this which are so suitable for amateurs, or persons possessing but limited accommodation for plant-growing. It is more beautiful than many varieties of *Amaryllis*, while it is not nearly so troublesome to manage; and its fine umbels of bright-coloured flowers last in perfection for weeks in a cool greenhouse. It is easily propagated by means of offsets, which are produced freely on established plants. These should be taken off before growth commences in spring, and planted in separate pots, putting one or more into a pot just sufficiently large to conveniently admit the roots, according as the object may be to increase the number of the plants or to have useful-sized specimens for flowering as soon as possible. After potting, they should be put in a close pit, and sparingly supplied with water at the root, sprinkling them overhead morning and evening in fine weather until they emit fresh roots, when a free supply should be given at the root. When fairly established, after potting, which will soon be the case, the plants should be placed near the glass, and freely exposed to the air on every favourable opportunity, affording them a temperature of about 50° at night, and allowing it to rise 10° or 15° with sun heat. As soon as the pots are well filled with active roots, shift into others some two inches wider.

During the warm months of summer the plants will do very well in a close part of the greenhouse, or a cold frame; the latter, how-

ever, will be the most suitable, as the atmosphere can be kept more moist, and the plants will make finer and more robust foliage here than in the greenhouse. Whether flowers will be produced the first season or not, will depend on the age and strength of the offsets; for unless these are strong when taken off, they will not flower the first season. But as the *Vallota* flowers under ordinary treatment towards September, and this without any particular means being used to do so, beginners cannot do better than treat their plants well during the growing season, exposing them freely to sunshine after the beginning or middle of August; and if they do not bloom the first season, they will be sufficiently strong to do so the second. The plant should be more freely exposed to air as winter draws on, and the supply of moisture, both at the roots and in the atmosphere, should also be gradually decreased; for, although it may be dried off and allowed to lose its foliage in the winter, as is sometimes done, it does better when not allowed to quite die down. Therefore the plants should be wintered in an airy part of the greenhouse, and be very sparingly supplied with water, giving just enough to preserve the foliage in health.

Towards the middle of March the plants should be encouraged to make growth, by removing them to a close pit, or the warmest part of the greenhouse, and gradually increasing the supply of moisture. The same treatment as already recommended will be suitable during the growing season, except the repotting will probably be unnecessary, for the *Vallota* flowers more profusely when not over-potted, and, of course, the plants should be placed in a dry, airy, cool atmosphere while in bloom, in order to preserve the beauty of the flowers as long as possible. If large masses are desired without loss of time, however, a moderate shift should be given in spring to such as have bloomed the previous season, until they are in 12 or 15-inch pots, which will be sufficiently large to grow splendid masses. And as it is not desirable to break up the plants oftener than can be avoided, the offsets should be removed occasionally from established masses, taking care to disturb the flowering bulbs as little as possible, and weak manure-water given during the growing season will assist in preserving the vigour of such as have been grown for several seasons in the same pots. But the *Vallota* will flower finely in 8-inch pots, and those whose accommodation is not suitable for large specimens may with kindly treatment bloom it profusely for two or three years in this sized pot without breaking up or shifting.

When it is deemed advisable to break up the specimens, in order to afford them fresh soil, which will be necessary occasionally, this should be done just before starting them into growth in spring, and care should be taken to injure the roots as little as possible, and very little water should be given after breaking up and repotting, especially in the case of large pots being used until growth commences, as a too free supply while the roots are inactive would tend to sour and ruin the soil.

A compost consisting of about one-half turfy loam, one-third good rich peat, and the remainder decayed leaf-soil, well inter-

September.

mixed with a sufficiency of sharp sand, will be found to answer perfectly for the growth of this plant. In potting care should be taken to secure perfect drainage, and this should be effected by the careful arrangement of a moderate quantity of crocks and not by half-filling the pots with them.

LAYERING CARNATIONS.



THE operation of layering is one of some nicety, and consequently there are many who do not do it at all well. Much has been written about it; but it requires practice and patience to do it properly. The system generally followed, and the one that I find to answer best, is, after having provided an equal quantity of road dust and decayed leaves, or other vegetable soils, well mixed, and a quantity of pegs, either made of fern, or what is better, leaden ones cast in a mould, I place my pot in a wheelbarrow or on a low table, and take my seat in front. I then, with a sharp knife, remove the lower leaves close to the stem, and shorten the ends of the others; but I am not fond of cutting away too much. When all the layers are trimmed, some of the compost must be put on the pot; and having selected the joint to cut through, I place my finger at the back, to keep it steady, and gently insert the point of my knife in the centre of the stem, pushing it gently forward with the edge downward, till the blade is half through. I then give the handle a slight twist, and bring the blade out below the joint on the under side, thus forming a nice tongue. The nib is then cut back to a joint, and the piece of leaf stripped off, leaving a small bud at the bottom. It is then carefully pegged down in the fine soil which had been placed on the pot. Each layer is operated on in a similar manner. When all are down, they have a little more soil put on them, but they should by no means be buried deeply. It sometimes happens that there are shoots so high as not to be conveniently brought down to the same level as the others; when this is the case, a large piece of broken pot is placed within the rim, which holds up the soil, and makes a higher surface, in which they are layered; or sometimes they will be long enough to insert in small pots placed close to the stem. After having got all the shoots down and slightly covered with soil, I place smooth flat stones, about the size of a halfpenny, over the cut of each layer. This not only prevents the soil from being washed away from that particular part, but it very much accelerates the rooting; for if the weather is hot, and the soil in other parts of the pot dry, if you examine beneath these stones, a genial moisture will be perceived; yet the pebbles absorb heat, which they slowly give out, much to the benefit of the layers. I must here notice the operation of piping; and though the Carnation is much more difficult to root than the Pink, yet I have adopted it with tolerable success; the great matter is to do them early, for they require

plenty of time. I insert them in a light soil, under a north-east wall, and having watered, to settle the soil about them, when perfectly dry, they are covered with a hand-glass. They sometimes require a slight shade, and I do not remove the glass till I see they are establishing themselves, unless any damp off; in that case they are taken away.

Worms sometimes prove injurious both to pipings and to layers. When that happens, a little water, in which hot lime has been slaked, should be poured over their holes. The layers must be constantly watched, and soil added now and then, but it must be with a sparing hand. They may be watered most evenings in hot weather, but it should be with water which has been exposed to the action of the sun during the day; and but little other attention will be required till they are ready to take off. If seed has been saved it should remain in the pods till next spring; about the latter end of April it may be rubbed out, and sown in shallow pans, or on a bed, covering it slightly with soil. It may remain there till the plants are about three inches high, when they may be planted out on a moderately rich bed. It is well not to have them too strong the first winter; but the following spring the surface of the soil may be covered with a rich compost. As the seedlings spindle, the single ones should be removed, to give the others room; and should the raiser be fortunate enough to have one which strikes his fancy, he may layer it, and adopt the same means and precautions as I have before stated.

PULTENÆA.



MOST of the species of this genus are exceedingly handsome greenhouse shrubs, being of a very compact habit of growth, profuse bloomers, and the flowers, if guarded from damp and bright sunshine, remain long in perfection in a cool house. Beginners should be careful in procuring young plants from the nursery, to select such as are dwarf and healthy, with short-jointed robust wood; for they will find, if they procure weakly or sickly plants, that they are rather difficult subjects.

If the young plants are obtained at once, they should be placed in an airy part of the greenhouse close to the glass, and be very carefully supplied with water, for it is too late in the season to do much in the way of encouraging growth; but if they are found to be much pot-bound, a smaller shift may be given, which will induce the formation of active roots, and cause them to break strongly in spring.

Shifting, however, should be deferred until spring, unless the plants are in actual want of more pot room; for, in the case of beginners, there is some risk in repotting such things as are at all delicate just before winter. The principal points to be

attended to during the winter season are, giving a proper supply of water at the root, and admitting air at every favourable opportunity, avoiding exposing the plants to cold wind, and keeping them near the glass. Towards the middle of March encourage growth by keeping the plants rather close; but the night temperature should not exceed 40° or 45° , and air should be admitted by day whenever the state of the weather will admit, and the plants must be kept near the glass. Before inducing growth, any straggling shoot should be cut back, and the branches neatly tied out, keeping them well down towards the pot, and rather thin, so as to admit light and air, and induce them to break closely and strongly.

The state of the roots should also be seen to, giving more pot-room to such as require it; but it will be safer to defer shifting until growth has fairly commenced, unless in the case of such as are found to be much pot-bound. The atmosphere should be kept moist, giving the plants a gentle syringing on the afternoons of fine days, and shutting up early, so as to avoid having to use fire-heat, which is apt to render the atmosphere too dry for these plants.

As soon as the buds are started into growth, will be the proper time for repotting, and this should be attended to before the plants suffer through the want of pot-room. See to having the ball and soil in a proper state as to moisture at the time of repotting, and make the new soil rather firm about the ball. Very little water will be required for some time after potting, if the atmosphere is kept rather close and thoroughly moist, and no more should be given than may be wanted; for over-watering directly after potting is very apt to saturate the fresh soil, which, in a case of delicate-rooted plants, is most injurious. Whenever the weather becomes sufficiently mild to allow of managing the plants in a cold frame without exposing them to a lower temperature, this will be the best situation for them, as the atmosphere, etc., will be more under control. The treatment here during the summer will consist in giving free admission to air on all fine days, a proper supply of water to the soil, and a slight shade from the direct rays of the mid-day sun. Any shoots that incline to out-grow the others, or to become straggling, should be pinched back, in order to maintain a close bushy habit; and when the nights become warm the lights may be thrown off the last thing in the evening, so as to expose the plants to the dew, which will greatly assist in keeping the wood strong; but the glass should be kept on while the air inclines to coldness, or during the prevalence of drying winds, and the plants should be moistened overhead in the afternoon, and shut down close for the evening. Vigorous-growing specimens will probably require a second shift early in summer, and this should be attended to whenever it is necessary, and every means used to maintain vigorous growth. Use the shading very sparingly towards autumn, and discontinue the use of the syringe whenever the weather becomes damp and cloudy, and expose the plants freely to air, in order to ripen the wood before winter. A light, airy situation near the glass in the greenhouse should be afforded them in winter, and they should be removed to this place whenever damp, cloudy weather sets in.

By subjecting the plants to similar treatment a second season, and with good management, they should be nice-sized specimens for flowering; but those intended to flower should not be kept growing too late in autumn, as in this case they would probably not bloom so freely.

Flowering specimens should be allowed to remain in some cool, airy part of the greenhouse until the blossoms open, and should be shaded from sunshine to preserve the beauty of the flowers, which soon fade under bright sunshine. After blooming, cut the shoots back sufficiently to insure a close growth; give a moderate shift, and keep rather moist and close, but not warm, until they get into free growth, and otherwise attend to them as already recommended; but large plants may be gradually inured to exposure to the open air and removed to a sheltered situation out of doors, where they will be screened from the mid-day sun. If placed in the open air, however, they must be carefully protected from heavy falls of rain, for they are very impatient of too much moisture at the root. Cuttings of the half-ripe wood root freely enough; but beginners will find it to their advantage to leave their propagation to those who have proper convenience, and give their attention to this part of plant culture. For soil, use the very best peat that can be procured, selecting prime fibry pieces, which should be broken up rather small, and well intermixed with a liberal allowance of sharp silver-sand and a sprinkling of lumpy bits of charcoal or clean small potsherds, to ensure the free percolation of water through the mass.

CYRTOCERAS REFLEXUM.



ALTHOUGH not one of the most showy of plants, this is certainly one of the most useful, being, under proper management, covered with its clusters of rather pretty and singular-looking flowers for several months at a time; they are produced from the axil of almost every leaf on the young wood, and the flowers remain long in perfection. But to have it in perfection it requires to be grown in a close, moist, warm temperature, and enjoys a gentle bottom-heat; and unless these conditions can be afforded it, there will be little chance of having it in a thriving state.

Propagation is easily effected by means of cuttings of the rather firm young wood, which root readily under a hand-glass in bottom-heat. The cuttings should be potted singly in small pots, as soon as they are well rooted, and replaced in a moist warm temperature, affording them bottom-heat until they become well-established; if possible, shade slightly from bright sunshine, keeping the atmosphere thoroughly moist, and sprinkling the plants frequently overhead, but water very cautiously at the root, for a soil saturated with water is very injurious to this plant. As soon as well estab-

lished, the point of the shoots should be pinched out, and they will require to be stopped occasionally as they progress in growth, if a bushy habit is to be secured; but this is of no importance in the case of small plants, as if allowed to grow in the form of a single shoot this can be coiled round stakes, which, with stopping, will cause the production of numerous shoots. Young plants should not be kept growing too late in autumn, for, unless they are afforded a period of rest, in order to thoroughly mature the wood, they will not break so freely the following spring. As soon as the object is to ripen the wood, the plants should be placed near the glass in a rather dry atmosphere, where they will be exposed to light and air on favourable occasions, and where they may remain for the winter, giving very little water to the soil. Except an occasional wipe, to clear the foliage of dust, the syringe should not be used; and at this season the temperature should not fall below 50° , nor rise above 60° without a circulation of air. Towards the middle or end of January the plants should be placed in a growing temperature, such as directed above, giving sufficient water to the soil to thoroughly moisten it, and repotting them as soon as the roots make a start. But before inducing growth, the shoots should be stopped and brought down, to cause them to break freely and assume a bushy habit. If well attended to, affording them a moist warm temperature, with a moderate bottom-heat, nice little specimens may be obtained by the end of the second season, and they will grow more freely if the flowers are picked off as they make their appearance, for these will be produced from the axil of almost every leaf on the young wood. Attend to stopping and training as may be necessary during the growing season, giving a second shift if requisite, and winter them as already directed. Plants for flowering will require exactly similar treatment to that recommended for growing them; and if they are placed in bottom-heat early in spring, and otherwise properly cared for, they will be in flower in May; and if kept in bottom-heat, etc., will go on growing and flowering till late in autumn. Or if desirable to remove them to a cooler place, this may be done, and the blossoms will last long in a cool dry atmosphere, but others will not be produced to succeed them, as is the case when the plant is retained in heat. See to getting the wood well ripened annually before winter, and cut back and trim the specimens as may be necessary before inducing growth in spring, and immense bushes will be obtained in the course of a few years. As this *Cyrtoceras* is impatient of any excess of moisture at the root, a hard fibrous peat should be used, such as water will pass through freely; this should be broken up into small lumpy pieces, rejecting the fine, and mixed with about one-third its bulk of charcoal, broken small, and a moderate quantity of sharp white sand. In potting, avoid large shifts, and secure efficient drainage by using plenty of potsherds, and covering them with some fibry pieces of soil.

CULTURE OF THE POLYANTHUS.

BY A SUBSCRIBER.



SOME prefer growing this plant in pits—a system I never adopt, as they require much greater attention, are far more delicate in habit, and never increase so well under this mode of treatment. Others separate and replant in the beginning of August, and frequently lose a great many plants by so doing, which, in my opinion, is one reason why Polyanthus are so scarce. But they quietly content themselves that some few are spared, and directly attribute the loss to hot weather, which is a mistake; for, at this season, the plants are almost, I may say, in a dormant state; in fact, the old foliage is fading, the new is not advancing, and if removed, however suitable the weather, a great many will most assuredly die. The situation most suitable for them is a well-raised border on the north side of a quick or hawthorn fence. This serves as a shade during the hot months of summer, and also allows sufficient sun to reach the plants in spring. About this time (middle of September), or as soon as the new foliage is advanced two or three inches (not before), take up your plants, separate the increase, and plant them in the border, prepared of loamy turf, leaf soil, and rotten sheep-dung. Give them sufficient water to settle the soil at the roots, and, should the weather prove dry, repeat the watering accordingly. The plants may then be left without any further care. I never give mine any protection whatever through the winter, and, although the season may be severe, I do not lose a single plant. In the first week in April I select such as have made the best trusses, for exhibition, and, taking them from the border, with as much soil as possible, I place them in six-inch pots, give a gentle watering, and remove them to a more shady situation. I guard against snails by scattering a little barley chaff or common salt about the pots, or they would destroy the blooms, and my labour would be in vain. The careful removing of the plants rather improves the quality of the flowers than otherwise; but as soon as the day of exhibition is over, I replace them in the border, in their former situation. During the months of May, June, July, and August, a few branches stuck on the border will be of great service, and effectually prevent the sun from scorching the plants, which would injure them to a serious extent. Plenty of water must be supplied daily. Should the weather prove dry and hot, regularly soak them, or they will probably be attacked by red spider, which undoubtedly destroys numbers of plants every season. Should you be troubled with this pest, syringe the foliage without delay on the under-side, with some strong soap-suds. This will drive it away, if not destroy it, and there is no fear of being troubled a second time, as it will never return to the plants any more that season. I have always found one application effectual, and the plants have not suffered in the slightest degree. By the above treatment I have always had a fine bloom.

September.

THE CULTURE OF STEPHANOTIS FLORIBUNDA.



THIS is a lady's flower, *par excellence*, for nothing can equal it for bouquets and dressing-up epergnes, and for all other uses to which cut flowers can be applied. It, however, is not grown so extensively as it should be, simply because the great body of amateurs imagine that to grow and flower it well a very strong heat is required. It will not do any good in an ordinary greenhouse temperature, because there would not be sufficient heat to enable the growth to be made early enough in the season to get well ripened before the autumn; but it can be grown in a much lower temperature than is usually employed.

In the first place, secure a healthy plant in a 48-size pot early in March, and shift at once, if the pot is full of roots, into two sizes larger, and place in a temperature of 60° or 65°. Train the young growth over the roof of the house. To get an abundance of flowers, the wood must be exposed to the light, and training the growth to the roof affords the readiest means of attaining the desired object. If specimens are not required for exhibition, train the growth to the roof permanently; otherwise, regulate the growth carefully to allow of its being taken down, and placed upon a trellis fixed in the pot, just before coming into flower. Many *Stephanotis* growers are afraid of the little trouble incurred in transferring the growth from one trellis to the other, and grow them upon the pot trellis entirely. A very little thought will show that, when the growth is huddled together upon so contracted a space, it is impossible to receive sufficient light and air to thoroughly mature the young wood. When the specimens are not required to be moved about, it is best to train them on the roof altogether, as better growth is made, and the flowers show to greater advantage. When portable specimens are grown, put them on the trellis some time in March, and leave them there until the flowers are past, and then return them to the roof.

It is difficult, if not impossible, to say when the next shift will be required, in a case like this, where everything depends upon the progress each individual specimen makes, for it is no use to repot them before they are well rooted. With ordinary treatment they, however, will be in proper condition for repotting early in June. Use pots two sizes larger, and be very particular in having them properly drained, as this shift will have to carry them through the whole of the next year; and no stove plant is more impatient of having stagnant moisture or sour soil about the roots than the one we are now dealing with. A compost, consisting of equal parts fibrous peat, turfy loam, and rotten cow-dung, is the best that can possibly be had, when mixed with a sixth part of sharp silver-sand, or good drift-sand, washed clean. The peat and loam must be broken up roughly, and if it has been laid in a heap a few months previously to using, its value will be enhanced.

A temperature of about 60° is advised as desirable to begin with;

this must be continued to the end of the month, when a rise of 5° may be allowed. This will not necessitate an increase of fire-heat, as the sun will have gained sufficient strength to bring the temperature up to the desired height without artificial aid. This can go on until about the middle of May, when fire-heat can be dispensed with, excepting a little to warm the pipes in the evening, to maintain a comfortable warmth during the night; but the night temperature always ought to be five or ten degrees lower than the warmth of the house during the day. From the beginning of June until the end of August no fire-heat whatever will be necessary, unless the summer happen to be wet and cold.

The plants ought to be steadily settling down to rest after the commencement of September, and a temperature of 60° will be quite sufficient to keep them in health. If they are subjected to a greater warmth than that specified above, it will force them into a second growth, and do irreparable injury. During the winter, which we will suppose to begin in October, and end in March, 50° will be quite high enough; and from that time onwards, the temperature of the respective seasons must be the same as I have already advised, so that it is not necessary to say anything farther about that part of the treatment.

In the first week of March of the second year, top-dress with the soil recommended above, and slightly increase the supply of water to the roots, when, with the aid of an occasional skiff from the syringe overhead, they will speedily start into growth. The pots into which they were shifted in June will carry them through this year; but it will be well to shift into one size larger in the spring of the third year.

Syringe regularly morning and afternoon throughout the growing season, excepting when in bloom, as the water would, of course, soon spoil the flowers. When growing briskly, a somewhat liberal supply of water will be necessary, but in the season of rest only give enough to keep the foliage plump and fresh; no manure water will be required the first year, but it will be of immense benefit to them if they are watered alternately with weak manure water, and clear soft water. Water in which sheep-droppings have been steeped makes the best liquid manure with which I am acquainted, and is far more suitable for this purpose than stimulating manures like guano.

PAVETTAS.



THESE useful plants require to be wintered in a house where the temperature may average about 50° , and should be kept rather dry at the root in winter. As soon after the beginning of February as circumstances will permit, place them in a moist growing temperature of from 60° to 70° , and if they can be afforded a mild bottom-heat, this will greatly assist in promoting active growth. Keep the plants near the glass, and expose them to all the light possible, admitting

air whenever the weather permits. If the plants are at all straggling, the shoots should be tied down in nearly a horizontal position, and stopped to cause them to break close and form nice bushy foundations; and the foliage, if at all infested with insects, should be carefully washed before placing them in heat. Attention must also be paid to the state of the roots, giving a moderate shift to such as have well filled their pots with active roots before placing them in growing circumstances. If in bottom-heat, the plants must be very sparingly watered for some time after shifting; for when the pots are plunged in any damp material, very little water is required, and inexperienced cultivators are apt to suppose that because the surface appears dry, the ball must be so also, and very often rot the roots by giving too much water. But in the case of young plants this little difficulty is easily overcome, as the pots can be easily lifted and weighed in the hand, which is the safest way of ascertaining the state of the soil as to moisture. Endeavour to keep the atmosphere regularly moist, and syringe the plants overhead on the evenings of fine days, and as the sun becomes powerful afford them a slight shade on the forenoons of bright days, but use this merely when necessary to prevent the leaves scorching.

As the plants advance in growth, attend to keeping the shoots regularly tied out and stopped, so as to secure compact, bushy growth, and shift into larger pots before they sustain any check through the want of sufficient space for their roots. If properly attended to, the plants will make rapid progress, and will form nice-sized specimens in course of the season; but if they are intended for flowering the following spring, they must not be kept growing later in the autumn than will allow of getting the young wood well-ripened before winter, for unless this is attended to there may be some disappointment experienced through their not flowering freely; but if good-sized specimens are desired, they should be encouraged to grow as late in autumn as strong short-jointed wood can be obtained. Shading should, of course, be discontinued as early in autumn as it can be safely dispensed with. When vigorous short-jointed wood cannot be obtained in autumn, remove the plants to a cooler house, where the atmosphere can be kept rather dry, and air admitted on fine days to ripen the wood. During winter they should be afforded a temperature of about 55°, and be kept rather sparingly supplied with water at the root. If treated a second season as recommended above, they will form nice-sized specimens; but they must not be stopped too late in the autumn, as they will be expected to flower in the spring; and the wood must be well-matured, to ensure having a profusion of fine large heads of bloom. While in flower they should be shaded from bright sunshine, and not kept too warm nor damp, as the flowers will last longer in a rather cool dry atmosphere.

After flowering, and allowing the specimens a fortnight or so to recruit their energies, cut back any of the shoots as may be necessary to maintain a dwarf bushy habit, and thoroughly clean the foliage. Examine the state of the roots, and give a moderate shift if the ball is heavily matted with roots, and place them in a moist

growing temperature; but give air rather freely, and avoid keeping too warm, until the buds start into growth, otherwise they will be apt to break thinly. Good rich fibry peat, and sandy turfy loam, in the proportion of three parts of the former to one of the latter, forms a suitable compost for these plants. The peat and loam should be carefully broken up, and well intermixed with a liberal proportion of silver sand, to ensure the free percolation of water through the soil after the decay of the fibre. Cuttings of half ripe pieces of the young wood root freely in a sharp bottom-heat, and soon form useful sized plants.

NOTES ON TRANSPLANTING.



UTUMN is at hand, and planting will soon be commenced. A considerable experience as a landscape gardener assures me that good practical knowledge on the subject does not generally obtain among those most interested in the results. If this, and the succeeding papers which I purpose writing on the subject, should in any way remedy that, I shall be pleased. Professional men are, I believe, pretty well agreed as to the best time and mode of transplanting; and there are many excellent treatises from which, as far as principles are concerned, the amateur may glean the best advice, but while principles alone are of the highest value to the initiated, they often prove stumbling-blocks to the mere novice. To benefit him those principles must be illustrated, both in the rule and in the exception. I hope to do that.

As a general rule, the best season in which to transplant trees and shrubs is the autumn, from the last week in September till the same period in November. Evergreens especially should, if possible, be removed then. Of course, they may be safely planted at other periods; in fact, there is scarcely a month in the year in which evergreens, under certain conditions, may not be transplanted with perfect success; but, as a general rule, and in all operations of magnitude, some time between the periods named above should be chosen. Deciduous plants should be removed between the decay of the leaf in autumn, and the swelling of the bud in spring. So soon as the leaf begins to fade, is, however, the best time for the operation; but, as in the case of evergreens, the rule admits of many exceptions. These will be noticed in due course.

Of the comparative advantage of different periods of the year for removing evergreens, the following will furnish good examples. A year or two since a large number of shrubs and trees, principally evergreens, was removed under my directions. Circumstances which I had no influence over rendered it imperative that the operation of transplanting should be tardily proceeded with. In fact, the work was begun in the middle of August, and was hardly finished in the succeeding May. Every week during this long period, when the weather would allow, some shrubs were transplanted. I watched

the results of these proceedings with great interest, and I confess to have gleaned some valuable information from them. I should observe that the kinds of shrubs were principally Portugal Laurels, Laurestines, Arbutus, variegated Hollies, Sweet Bays, and Aucubas. Those moved in August suffered considerably in the loss of their leaves, especially the Laurestines, and assumed generally a yellow, sickly hue. Others transplanted during the first ten days of September succeeded little better; during the latter part of the same month, and in October and November, hardly indicated any effects of the operation. The weather, from the commencement of the work up to the beginning of November, was, upon the whole, dry. After this, heavy rains set in and continued till the middle of January. The plants removed during that time did not start so freely into growth in the following spring as those transplanted in October and the early part of November. The soil, it may be observed, was a stiff loam, and, from being newly trenched, was rendered by the digging and treading, consequent on the planting, anything but favourable for the roots. To this cause may undoubtedly be attributed the comparative ill success of the plants removed then. Towards the close of January frost set in, and planting was suspended for a month; but during part of February and the whole of March and April, the work was carried on, and, as the succeeding summer showed, with varying success. Those removed in March, however, on the whole suffered most, many of them, especially some large Portugal Laurels, died back to within a foot or two of the ground; others lost the greater part of their branches. These, on being cut back, made vigorous growth in the following year. Of all the plants removed I do not think more than half-a-dozen died outright. Some of the shrubs transplanted in April deserve a special notice. Of these, several were large Portugal Laurels, requiring the united assistance of eight or ten men to lift. As they were placed in very important positions, every care was taken to insure success by careful removal, and each was well watered when planted. The only indication of their having changed places was the casting of a few of the older leaves. Notwithstanding the few failures, and the otherwise varying success, the result of the work, on the whole, may be considered as satisfactory. Two points in particular contributed to this success. The ground to be planted, from being trenched previously, had become thoroughly settled, and the plants themselves, having to be carried but short distances, received no material injury from being kept out of the ground.

Whenever planting is to be extensively undertaken, much of the success will depend on timely preliminaries being carried out. It is too much the practice to procrastinate in this, and to defer the preparation of the soil till it is time to plant the trees. Supposing the soil to require both draining and trenching, and in all new grounds these operations may be calculated on, by all means let them be finished in the summer preceding the planting season. If the soil is very stiff and unfavourable, a year's cultivation previous to planting would be of immense advantage; but under any cir-

cumstances, trenching should precede planting at least several weeks, if possible. The soil then becomes settled, and, from the action of the weather, well pulverized, and will be, in fact, in an excellent condition to receive plants. The difference in the success of shrubs planted in a nicely pulverized and otherwise well prepared soil, and in one newly trenched, stiff, and full of unbroken clods, is very great. In soils which require preparation, much of the success of the shrubs to be planted in it will depend on its being timely and efficiently performed.

Two years ago I made plans for a new garden in the neighbourhood of London; the proprietor of the ground superintended their execution, and, with the exception of a preliminary visit at the commencement of the work, I did not see the gardens until the ensuing spring, when I was consulted as to the cause of the most general failure of the shrubs. This was at once evident. The soil was very stiff—clay, in fact; and as it was trenched in the autumn and winter, and the plants immediately placed in it, it is easily imagined what kind of medium the roots enjoyed. The soil was, in fact, but a collection of lumps of clay with nothing to fill the interstices; nevertheless, attempts had been made at planting—it would be libellous to say that it was really performed. The winds of March, assisted by the sun, had converted the lumps of clay into brick, and robbed the ill-covered roots of every particle of moisture; the plants were, of course, dead or dying, and no art could save them then. In this case, an early preparation of the soil was not only advisable but imperative, if anything like success with the shrubs was to be hoped for. Such a soil should be broken up a year before planting, and well worked at intervals to bring it into a proper condition. All soils will yield to well-directed labour; the end to be attained is merely a question of time, labour, and expense. Those who are unfortunate enough to have an unfavourable soil to deal with, must incur all that if the best results are to be obtained. I have urged early attention to the preparation of the soil for planting, and I repeat it, because I am convinced of its importance. I could give many examples, not only of great inconvenience arising from a retardation in the progress of works, but of the waste of much time and money, resulting solely from an indifference to, or a total disregard of, such council. Half the failures in planting arise directly or indirectly from procrastination in this respect, and I shall have effected good service if fortunate enough to convince any apathetic reader of the fact.

In very stiff soils, where the spaces for the shrubberies, as well as those for the smaller clumps, only are trenches, something beyond the general drains (which will, of course, be laid down before any other work is commenced) will be required, if, as will often be the case, no general drain passes through them. Such spaces, from the compactness of the unbroken soil around, become reservoirs for water unless some means of escape is provided for it. This should always be given. An auxiliary drain entering a contiguous one is easily added, and will be found an effectual remedy. I have seen the worst effects result from non-attention to this. The bed so

circumstanced becomes converted into a quagmire, the roots of the shrubs perish, and, as a natural consequence, the plants sicken and die. In planting single specimens on the lawn, too, similar results will have to be guarded against, where the whole area of the ground has not been trenched. Whether a large or small site is prepared, there are few situations where a drain from the bottom will not be necessary. I remember an instance—one among many similar ones—where a number of Conifers were planted singly on a lawn, the soil of which was very tenacious. Holes were properly prepared by deep trenching and the addition of new soil, and the trees planted at the end of September. For a time all seemed well enough; but by the following spring many were dead, and others, especially the Junipers, of which there were several, had lost many branches from sheer rottenness. On examining the soil it was found to be little better than mud, especially at and near the bottom of the holes. The autumn and winter had been very wet, and as there was no outlet for the water, which of course collected in the loose soil, the trees had stood for three or four months with their roots in it, with what effect may easily be inferred. And, to make the matter worse, the plants had not been placed high enough at the collar in the first instance, and the soil having settled down below the natural level, that important part of every plant was nearly always surrounded by a pool of water. Great care should be taken to prevent this, and as it is difficult to calculate to a nicety when a tree is planted in newly moved soil, it should when possible be allowed to subside before the tree is placed in it. Every specimen on a lawn should stand a few inches at least above the natural level. It is important to secure this, both on account of the well-being of the plant and its appearance also. A tree standing on a gentle elevation, which seems to spring naturally from the surrounding lawn, has an infinitely superior appearance to one placed in a hollow, other circumstances being equal. Of course, the success of a transplanted shrub or tree will depend in no small degree upon the condition in which it is removed. A shrub may be planted with perfect success at a period by no means favourable to the operation if it is carefully taken up; while a similar one will fail at the best of all seasons from damage to its roots by unskilful or careless hands. A plant, it should be borne in mind, derives the chief amount of the fluids which support it by the agency of its succulent root-tips, and in proportion as these are destroyed, so are the resources of the plant cut off till new ones are formed. If I were not convinced by the practice I have often seen that this advice is needed, I would not venture on so commonplace an observation. Presuming the preparation of the soil for planting to be in every respect perfect, and the season fitting, subsequent labours will be greatly influenced by circumstances attending the plants to be removed—whether they have merely to be taken from one part of the grounds to another, or at most but a short distance; or received from a nursery many miles away, and after a journey, possibly, of two or three days' duration. It will be readily understood that the conditions of the respective plants must differ materially, and will consequently

demand a different mode of treatment. I must here beg permission to say that nurserymen are frequently charged with sending inferior plants, from their being found dead a month or two after planting, when, in reality, the person that superintended the work is the guilty party. Having made this charge, I must, in fairness, give the evidence upon which it is founded—evidence, be it understood, by no means circumstantial, but essentially practical, and which I have seen many times confirmed. Well, then, a nurseryman receives an order for a given number of trees and shrubs, with instructions to send them by rail to a certain station, from which they will be taken by the waggons of his customer. They are, of course, despatched, and in due time reach the ground where they are to be planted, though, thanks to the tardiness of railway transit, they are often a long time on the road. Now, it frequently happens that the weather is very warm and sunny during the whole time the plants are out of the ground, and when they reach their destination the roots are completely dried up, and the plants otherwise drained of their moisture by evaporation. In this condition have I seen plants, and that not seldom, thrown in heaps upon the ground where they were to be planted, with perhaps an old mat or two cast over them as an apology for a covering from the wind and sun, but often with no covering at all, and then put into the ground without any other care or preparation. Small deciduous plants may, and in a measure do, bear up against such treatment; but that evergreens should survive it is a standing miracle to any one at all conversant with the constitution and requirements of vegetable life. Of course, very many failures do result; nothing less could, under the circumstances, be reasonably hoped for. I have no wish to hold up nurserymen as immaculate, or to deny that some of them do not at times send out coarse-rooted plants, and that numerous deaths are the consequence; but I also know that losses arising from the causes above noticed are often unjustly laid to their charge. I am sure I shall be pardoned for making this little digression. Now, supposing a large number of plants to arrive in the condition above described, this is how I would treat them: Procure a tub or two, each a yard or so in diameter, and two feet deep. Fill them to within six inches of the rim with water and loam mixed to the consistency of cream. Let the roots of every plant be dipped in this, and immediately “laid in,” taking care that they are well covered with soil. For convenience, the plants should be placed in rows, and as each row is finished give a good watering, and not only at the root, but by means of a rose to the watering-pot well sprinkle their stems and branches. All the plants will imbibe a large amount of moisture through the soft parts of their stems and branches, and the evergreens in addition to their leaves. If in the day, and the sun is all powerful, some mats, or even straw, thrown over them will be very beneficial. At night this may be taken off, for the sake of the dew; but nevertheless another good sprinkling from the watering-pot may be given them with advantage. By the following morning the plants will be found to have imbibed moisture equivalent to what they lost on their journey. The roots, too, will be moist,

and in a condition to resume their functions immediately. The value of such treatment to exhausted plants can hardly be over-rated, and will often be found the turning-point between failure and success. Plants which are merely transplanted from one part of a garden to another are always benefited by the application of a few gallons of water at their removal. The best time to apply it is when sufficient soil has been thrown in to fairly cover the roots. If applied then the mould is well washed in among the fibres, and by filling in the remaining soil upon the wetted portion, evaporation is checked, and the moisture secured to be gradually appropriated by the plant. Mere surface watering is of little avail, unless very carefully and liberally supplied. Newly-planted trees are, however, often much benefited by mulching, and if employed as an auxiliary to watering, a double advantage is afforded by it.

(To be continued.)

THE ODOURS OF PLANTS AND THE MODE OF OBTAINING THEM.



THE exquisite pleasure derived from smelling at fragrant flowers would almost instinctively induce man to attempt to separate the odoriferous principle from them, so as to have the perfume when the season denies the flowers; and thus we find the alchemists of old torturing the plants in every way their invention could devise for this end. Their experiments were not wholly unsuccessful, and indeed upon their foundation the whole art of perfumery has been reared. Besides the uses in perfumery, the essential oils (the matters to which the odour of the plant is due) are used by druggists to cover the bad taste of medicines. Peppermint, coriander, and cassia are much used for this purpose, and as the sense of smell has much to do with taste, their utility is obvious; by closing the nostrils, many very nasty physics may be swallowed without tasting, particularly rhubarb. We here see the advantage of the domestic subterfuge of "a little peppermint" with a home "dose of castor oil," or a peppermint lozenge before the "cup of salts and senna." Without recapitulating those facts, which may be found diffused through nearly all the old authors on medical botany, and works of this character, we may state at once the mode of operation adopted by the practical perfumer of the present day for preparing the various extracts of essences, waters, oils, etc., used in his calling. The processes are divided into four distinct operations.

1. **EXPRESSION**, or the squeezing the odour-giving part of the plant between two metal plates, which are generally made hot (though sometimes cold, and hence the term "cold-drawn"), and forced together by a powerful screw. This process is only adopted where the plant is very prolific in its oil, *i.e.*, odour.

2. **DISTILLATION**.—The plant, or part required, is placed in a

metal pan, and covered with water; to the pan a dome-shaped lid is fitted, terminating with a pipe, which is twisted cork-screw fashion, and fixed in a bucket, with the end peeping out like a tap in a barrel. The water in the still is made to boil, and having no other exit, the steam must pass through the coiling pipe, which being surrounded by cold water in the bucket, condenses the vapour before it can arrive at the tap; with the steam, the volatile oil or perfume rises, and is liquefied at the same time. The liquids which thus run over, on standing for a time, separate into two portions, and are finally divided with a funnel, having a stop-cock in the narrow part of it. By this process the majority of the oils or perfumes are procured. It so happens, however, that the finest odours, the *recherché*, as the French say, cannot be procured by this method. Then recourse is had to

3. MACERATION.—This operation is conducted thus: For what is called pomade, a certain quantity of purified hog's lard and mutton suet are put into a clean metal pan; this being melted, the kind of flowers required for the odour wanted are carefully picked and put into the liquid fat, and allowed to remain from twelve to forty-eight hours. The fat has a particular affinity, or attraction, for the oil of flowers, and thus, as it were, draws it out of them, and becomes itself by their aid highly perfumed. The fat is strained from the spent flowers, and fresh ones are added four or five times over, till the pomade is of the required strength. For perfumed oils the same operation is followed; but in lieu of the lard and suet, fine olive oil of Ben is used, and the same results are obtained. These preparations are called *Huiles Antiques*, or commonly French oils of such and such a flower. When neither of the foregoing processes give satisfactory results, the method of procedure adopted is by

4. ABSORPTION.—The odours of some flowers are so delicate, or, as the French call it, *en fleurage*, that the heat required in the previously named process would greatly modify, if not entirely spoil them. This process is, therefore, conducted cold, thus: Square frames, about three inches deep, with a glass bottom, say two feet wide and three feet long, are procured; over the glass a layer of fat (lard and suet) is spread about half an inch thick, with a kind of plaster knife or spatula; into this the flower-buds are stuck and ranged completely over it, and there left from twelve to seventy-two hours. Some houses have got 2000 and 3000 such frames; and as they are filled they are piled one over the other; the flowers are changed so long as the plant continues in season, sometimes over a time of two or three months.

For oils of the same plants, coarse linen cloths are imbued with the finest olive oil, and stretched upon a frame made of iron; on these the flowers are laid and suffered to remain a few days. This operation is repeated several times, after which the cloths are subjected to great pressure, to remove the now perfumed oil.

As we cannot give any general rule for working, without misleading the reader, we prefer explaining the process required for each when we come to speak of the individual flower or plant.

Whenever a still is named, or the article is said to be distilled or "drawn," it must be understood to be drawn so by steam apparatus; and this is the only mode which can be adopted for obtaining anything like a delicate odour, the old plan of having the fire immediately under the still, conveying an empyreumatic smell to the result, has become obsolete in every well-regulated perfumatory. The steam-still differs from the one described only in the lower part, or pan, which is made double, so as to allow steam from a boiler to circulate round the pan for the purpose of boiling the contents, instead of the direct fire. In macerating, the heat is applied in the same way, or by a contrivance like the glue-pot, as made use of now-a-days.

This description of apparatus will be found very useful for experiments, which we will suggest by-and-by.

The perfumes, as found in the shops of Paris and London, are either simple or compound; the former are called Extracts, and the latter Bouquets, which are mixtures of the extracts, so compounded in quantity that no one flower can be discovered as predominating over the odour of another; and when made of the delicate-scented flowers, carefully blended, they produce an exquisite sensation on the olfactory nerves, and are therefore much prized by those whose wealth enables them to indulge in such pleasures.

EARLY HYACINTHS.



WHEN the first of September arrives, and the fields have yielded up their produce to the ricks and barns, the observer of Nature begins to catch, as from a distance, the signs of the approach of winter. The breath of morn has a different character, and evening pours down colder dews. Leaves become sere and yellow, and, falling at our feet, remind us that their work is done, and that very soon the branches from which they have been driven will be completely bare. To the gardener who loves his occupation still more numerous and painful premonitions are conveyed of the decay of his favourites. For, although the flower-garden is now more beautiful than ever, he knows that loveliness is no guarantee of perpetuity. A frosty morning will soon turn all this sparkling scene to blackness, leaving nothing behind but withered foliage and unsightly stems.

"Lover, trust not to her eyes,
When they sparkle most, she dies!"

But the amateur will be cheered with the reflection that, as the revolving seasons consign one part of Nature's works to decay, they call into existence new beauties, and that even winter will be graced with a floral wreath. Among the flowers composing this wintry garland the hyacinth is conspicuous, and its admirers should immediately commence its cultivation. The most frequent cause of failure

in the growth of this bulb is the habit of planting it too late—a practice which would cease if the physiology of gardening were more studied. If a hyacinth is now examined, it will be found that growth is proceeding, developing itself in the plumpness of the incipient roots, and the putting forth of the green protuberance to be soon evolved into the leaves. This is the case, more or less, as the sorts are early or late, with the bulbs out of the ground; but those which have been left to the natural treatment, and have not been taken up, will be found much more forward, the roots in some cases having grown some inches. Now, it should be remembered that when the vital powers of a plant become active, every day it is out of the ground it is receiving an injury; and if hyacinths are left to make vain efforts at growth until November or December, the future plant must suffer; in some cases roots will be scarcely protruded, and the flowers will consequently be diminutive and poor. If you wish to have as fine a bloom and as vigorous growth as possible, purchase your bulbs at once, and let the earlier sorts be immediately potted. Good catalogues distinguish those roots which are early and late, and also those which will succeed best in water or in the ground. Those you intend for glasses should be put within the eighth of an inch of the water, and shut up in the dark until roots appear—indeed, until they have grown an inch or two.

The principle to recollect is this—roots grow before the leaves, and grow in the dark. If, therefore, a hyacinth is placed in water and put in a window, the growth of the foliage will be prematurely excited. But by keeping the root in darkness, Nature will be followed, the downward process will make way before light is brought to bear on the evolution of the leaves and flower.

If you grow hyacinths in pots, those which are deepest in relation to their width should be preferred. A pot six inches deep and about four wide will do well for this flower. A soil composed of decayed leaves and sand will answer best. A good drainage should be provided. In potting, let the bulb stand high, so that about one-third shall appear above the soil. The pots must then be buried in a moist but not wet place, and allowed to remain there until a growth of about half an inch appears in the foliage. They will then be fit for forcing, either in a frame or greenhouse, or the window of a sitting-room.

PREPARING FOR WINTER.



THE time has arrived when every gardener who wishes to manifest an acquaintance with his profession will be looking round the sphere of his operations to see what is to be done in reference to the approaching cold season. His head must be employed, and his hands actively engaged, from the present time up to Christmas, when probably rain and frosts may keep him in-doors. Neglect now will

be productive of fatal results, for gardens in the present day are as full of exotics as of indigenous productions, and various differences of treatment are demanded for the preservation of the stock until another year.

Begin your perambulations, then, at once, and let nothing escape you, in the kitchen garden, the flower garden, the shrubbery, and the greenhouse. Look towards the future, and carefully mark what is to be done. In the kitchen garden you must decide at once what plots of ground you will leave fallow, to be thrown up in ridges during the winter, that the soil may be pulverized and ready for early crops, and what portions you will plant and sow at once. Seed beds of cauliflowers, cabbages, to be cut young, and others to remain till the spring and summer. Spinach may still be sown; also some onions. Some cultivators recommend parsnip sowing at this season in preference to the spring; and it would be well to try the experiment, if you have not done so. Do not neglect to leave a piece of ground for autumn-planted potatoes, as the advantages of the plan are so well attested, provided proper precautions are taken as to soil, mode of planting, etc. Old broccolis and winter greens must be earthed up as a means of promoting growth, and guarding against frost. The branching of celery should proceed gradually, about two inches at a time, care being taken to prevent the soil falling into the heart of the plant, and at the same time not to crush and twist the tender tissues, as is often done by the rough grasp of the gardener. Finally, attend to cleanliness. Strawberry beds should be finished off now, and not left in a wild, rank state till the spring. Pea-sticks, and all decayed haulm, and all weeds, should be removed, not only that neatness may give its charm to the garden, but also to prevent the rapid production of damp and mouldiness which are quickly generated among masses of decaying vegetation. In the flower garden you should consider what departments you intend devoting to bulbs, and the beds must be prepared for that purpose as soon as possible. A difficulty is felt in this case, on account of the beds being often occupied till late in the season by autumnal flowers, which we are of course unwilling to sacrifice before the frost commits its ravages. Here there is no remedy but to pot hyacinths and other bulbs, which ought to be growing; and then to have them out as soon as the beds are ready. Attention should now be given to taking up plants which it is desirable to preserve, a few at a time, so as not to leave gaps, or spoil the general appearance of the garden. Young fuchsias, pelargoniums, and verbenas, if taken up carefully, and placed in a shaded frame after being potted, will flag scarcely at all. They will form pretty window plants till Christmas, and, what is more important, will constitute a stock to propagate from in the spring. Tender greenhouse plants, which have been out of doors during the summer, must be watched, lest an unexpected frost should injure them. They need not be taken in, but the amateur should have his eye upon them, and when the night is brilliant and frosty, the most sensitive should be put under shelter. The cuttings prepared for next year should now be looked over, and, if they are rooted, may be potted, either singly, or

three or four together, according to their habits. Every piping of pinks and carnations must be in the ground or pots at once, if you wish them to stand the winter. The secret of preserving these beautiful plants is to secure plenty of roots. Pinks and carnations cannot endure much moisture, and they must, therefore, have plenty of drainage, abundance of air, and be planted high on the ground. The same remarks apply to auriculas and polyanthus, *et hoc genus omne*. Some people treat plants as they do children—they love to make them comfortable, and they tuck them up with mould to keep them warm, until warmth and damp combined destroy them. The natives of the Alps and dry extended plains cannot be petted in this way with impunity.

HARDENBERGIAS.



THESE are, for the most part, free-growing, profuse-blooming plants, which are so admirably adapted for the decoration of the greenhouse or conservatory, during the spring and early summer months, as to make it worth while to grow them in pots for that purpose. Cultivated in this way, it is no difficult matter to have some of the species in flower early in March, or to retard them till May; and if plants are prepared for early blooming, by ripening the wood well in autumn, and keeping them cool during the early winter months, very little excitement will be needed in order to flower them even in February. Plants obtained at the present season from a nursery, may be placed in a cool airy part of the greenhouse, where they may remain during the winter, and will require little attention beyond a proper supply of water, unless they are pot-bound when received, in which case they should have a small shift, and be kept rather close for a month or six weeks, in order to induce the roots to strike into the fresh soil. Early in March, or as soon after as convenient, place them in a moist-growing temperature of about 45° at night, and 55° by day, where they will soon start into growth. Have an eye to the state of the roots, and have soil, etc., in readiness for shifting, such plants as may have well filled their pots with healthy roots, but defer shifting generally until the roots require pot-room, and be careful to have the balls and fresh soil in a moist, healthy, state before repotting the plants. A slight increase of temperature with a corresponding amount of moisture in the atmosphere, will be found beneficial for fresh-potted plants, in inducing active growth, and avoiding the necessity of giving much water to the soil until the roots can lay hold of it. When the plants start into vigorous growth, a liberal supply of water at the root will be necessary, and air should be admitted freely on every favourable occasion, avoiding, however, cold drying currents, and during the early part of spring the plants should occupy a position where they will receive all the light possible. Towards the middle of May remove them to a cold pit, which will form a very suitable situation for them during the

summer months. A slight shade thrown over the glass for a few hours in the forenoons of bright days, will be of great service to them; but this should be used sparingly, and should be of such material as will merely break the force of the sun's rays, without darkening the pit. Too much air can hardly be given, except when dry parching winds prevail, when the lights should be raised on the sheltered side, shading the glass, to keep down the temperature, if necessary, and on mild settled nights the lights may be left off, so as to give the plants the benefit of the night dews. Maintain a moist atmosphere by sprinkling the plants overhead with the syringe on the mornings and evenings of bright days, and if the pots stand on a bed of coal-ashes, keep the latter frequently watered.

A second shift will probably be necessary in the case of vigorous growing specimens, early in June; this should be afforded them before the roots get matted, and strong plants will bear a liberal shift at this season.

They will require some means of support, and whether trellises or stakes are used, it will be necessary to commence training before the shoots get entwined, otherwise they will be troublesome to undo, and will probably sustain injury in the operation; any gross shoot should also be stopped, in order to equalize the growth and secure well-furnished specimens. When the weather becomes cool in autumn, discontinue syringing overhead, and keep the atmosphere drier, with a view to ripen the young wood; and when the weather becomes unsettled, remove them to a light, airy part of the greenhouse, which will be a proper situation for them during the winter and spring months, when they should be carefully watered, giving a liberal soaking when necessary, and no more until it is wanted. When in flower they should occupy a cool, airy situation, and if they can be screened from the midday sun the blossoms will retain their beauty longer; when large specimens are wanted without loss of time, however, it will be advisable to cut back the shoots so as to remove most of the flowering wood, and to start the plants into growth early in spring, allowing them another season's growth before permitting them to bloom. And full grown specimens, after flowering, will require to be cut back rather severely, well thinning out the weaker shoots; they should be kept under glass until they start into growth, when they may be removed to a shady part of the plant ground, and inured to exposure in the open air, where they will make sufficient growth during the summer months. With a small shift every season, or every alternate one, and careful watering, etc., giving weak clear manure-water occasionally, they will last for several years. Young plants are easily obtained either by means of cuttings of short-jointed pieces of young wood, when about half ripe, treated in the ordinary way, or by seeds, which are produced freely, and afford a ready means of getting a stock of young plants, and it is advisable to be prepared with these rather than to retain old ones after they cannot be afforded sufficient fresh soil to keep them in vigorous health. For soil, take good rich turfy peat and nice sandy turfy loam, in the proportion of about two of the former to one of the latter; and after breaking up the turf into small pieces, and

selecting the best, add a liberal mixture of sharp sand, broken pots-herds, or small pieces of charcoal, to insure the free percolation of water through the mass after the fibre has become decayed.

PENTAS CARNEA.



THIS desirable plant, though not of very recent introduction, is deserving of especial notice, on account of its excellent habit of flowering long and freely, and also because it is exceedingly easy to manage. Its numerous trusses of delicate rose-coloured blossoms will be found very useful where cut flowers are much wanted.

The best time for propagating young plants is during spring, or the early part of summer. The cuttings should be taken off when two or three inches long, with a bit of the old wood attached. These should be inserted in a well-drained pot filled with a light sandy compost, and afterwards placed in a close hotbed, frame, or pit, where a warm atmosphere and a little bottom-heat can be obtained. In this situation, with due regard to watering, shading, etc., in a few weeks the cuttings will become well rooted, when they may be potted singly into three or four-inch pots, and replaced in a warm situation, as near the glass as possible. A temperature of from 60° to 65° will suit them well. With favourable weather, a gradual increase of air should be given, shading slightly in bright weather, if necessary, and syringing overhead on sunny afternoons. As they advance in growth, the principal shoots should be topped, and the plants repotted as the pots become filled with roots, observing that they should be topped a few days before or after potting, so as not to check the progress of the roots and branches at one time. If cuttings are rooted early in spring, by July they should be good compact bushes, in nine or ten-inch pots. If now large enough to suit the purpose of the cultivator, they may be allowed to flower, by discontinuing the stopping.

As the flower shoots advance, a little attention is requisite to tying out, or otherwise supporting them in an erect position. When in bloom the plants may, if required, be removed to a cool situation, where, if protected from cold winds, they will continue a long time in beauty. After flowering, I place them in a cool dry house, and during winter give only sufficient water to keep the foliage in health. Towards February or March, or earlier if required, I remove them to a warm house, previously pruning the branches into a compact form. When they have started into growth, the roots should be examined, and, if necessary, a shift given into larger pots. Stopping may now be continued only as long as it may be desirable to increase the size of the plant, which will be in flower in six or seven weeks after the last stop. If pruned back after the flowers are faded, a second and third crop of blossoms may be

obtained during the summer, and on the approach of autumn the plants should be thrown away, in order to make room for more young and vigorous stock.

The soil best adapted for the growth of this plant is a mixture of equal parts turfy loam, peat, and well-decomposed cow-dung; the two former should be broken small, and the latter sifted through a fine sieve. When mixed together, a liberal supply of sharp sand and some small pieces of charcoal should be added. The latter is a useful fertilizer, and assists in keeping the drainage in proper condition. Green-fly or thrips are the only pests to which this plant is liable, and both are easily destroyed by timely application of the usual remedies.

BOSSIÆS.



SOME of the species of Bossiæe deserve to be classed with the most beautiful of our greenhouse plants, and are indispensable in every well-furnished collection. All the sorts are profuse bloomers, and not difficult to cultivate; but they are subject to the attacks of red spider, which must be carefully guarded against; for if once it obtains a settlement, it is afterwards eradicated with much difficulty, and it soon disfigures the most vigorous specimens. If healthy plants are obtained at the present season, they will require merely the ordinary treatment of greenhouse plants during the winter; but if they are found to be pot-bound they should be afforded a small shift, and be placed in the closest part of the house for a month or so, in order to induce the formation of fresh roots. It is, however, advisable to avoid shifting at this season, and unless they are suffering for want of pot-room, it will be better to defer the operation till spring. Young plants should then be encouraged to start into growth early, so as to secure a long season. Therefore, about the beginning or middle of March, place them where the temperature may average about 45° at night, and from 55° to 60° by day, with a circulation of air, and keep the atmosphere as moist as can conveniently be done. Have soil in readiness, and as soon after placing them in growing circumstances as possible shift such as may have filled their pots with roots; but be careful to have the balls in a nice moist healthy state when the operation is performed, and keep rather close and warm, maintaining a moist atmosphere after potting, until the plants appear to have taken to the fresh soil. When fairly established in their fresh pots admit air freely on every favourable occasion, and see that they are placed near the glass, and where they will be fully exposed to light and sunshine. Give a gentle syringing on the mornings and afternoons of bright days; but this should be done after watering the soil, otherwise there is danger of being deceived, the soil appearing moist when beneath the surface it is dry. If red spider should make its appearance, the

plants should be laid upon a clean mat, in such a position as to allow of well washing the under side of the foliage without saturating the soil, and repeat this every other day until this pest is fairly overcome. It is advisable to use tepid water, and also to repeat the washing occasionally, although there may not be any evident necessity for doing so; for in this matter, more especially than in any other, a preventive is certainly better than a cure. As soon as the weather becomes sufficiently mild to allow of managing the plants in a cold frame without exposing them to a lower temperature, move them there, which will be a more congenial situation for them than a house where the temperature is kept up by artificial heat. The treatment here during the summer season will consist in giving free admission to air, a slight shade on the forenoons of bright days, and a proper supply of water to the soil, with a liberal use of the syringe. Some attention will, however, be required to accommodate the plants properly should cold parching winds occur immediately after they are placed in the frame. In this case, raise the light on the sheltered side, keep down the temperature by shading, and if necessary, shut up close at night, covering the glass with a double mat. During fine, warm weather, the lights may be left off at night, and the plants will be greatly improved by exposure to the night dews. Vigorous-growing examples will probably require a second shift early in the summer, and this should be attended to whenever it is necessary. A comparatively liberal shift may be given this time; but in this be guided by circumstances. Beyond a stake for the support of the leading shoot, and pinching out the points of any branches which may take a decided lead, hardly anything will be necessary in the way of training. Discontinue shading and syringing overhead as soon as the heat of summer is over, and let your aim, after this, be to ripen the wood and prepare the specimens for winter. When cold, damp weather sets in, remove them to their winter quarters, which should be a light airy situation near the glass in the greenhouse, and water cautiously while the plants are in a dormant state.

If large specimens are desired at once, it will be necessary to grow the plants a second season before allowing them to flower; and in this case they may be treated the second year just as recommended for the first, except that it will be necessary to cut back the shoots, so as to maintain a dwarf, compact habit. Specimens intended for flowering should be allowed to remain in the greenhouse, where they will bloom from the middle of April to the end of June, and the blossoms will remain longer in perfection if the plants are screened from the mid-day sun. After blooming, cut the shoots back sufficiently to ensure a compact plant, and as soon as growth commences give a moderate shift, removing them to the plant-ground as soon afterwards as the roots may appear to have laid hold of the fresh soil.

All the varieties seed freely, and cuttings of the half-ripe wood root with little difficulty; but, nevertheless, those who can obtain well-managed *Bossiaes* from the nursery will save nothing by attempting the propagation of these plants. For soil, take good turfy peat and

light sandy turfy loam, in the proportion of five of the former to one of the latter, and add a liberal quantity of sharp silver sand, and broken potsherds, or lumpy bits of charcoal, in order to ensure percolation of water through the mass after the decay of the fibre has taken place.

ON THE PRESERVATION OF FRUIT.



AMONGST the different materials for preserving fruits, recommended by different authors, are found the following:—Charcoal, sand, moss, oak-chaff, the husks of different grains, oats, sawdust, paper, bog-mould, beech and hazel flowers, bran, canvas, sealing-wax, hay, straw, and fern.

THE HUSKS of the different varieties of corn, as oats, barley, wheat, have been by some recommended for keeping fruit in; but I disapprove of them, on account of the obnoxious gases they absorb during the process of kiln-drying. Before being ground, however, these, as well as oak-chaff, answer well for packing, if the fruit has been previously surrounded with fine paper or linen, dried before the fire previous to being used.

OATS.—I have been informed that in Portugal, apples and pears have been preserved the whole year round by being packed in airtight vessels and surrounded with oats, which receive no injury by being in contact with the apples. This material is not, however, generally used for packing, as the grains of the oats are apt to bruise the apples.

SAWDUST.—This should never be used, except it can be procured from hard-wooded trees, such as oaks, beech, etc. The sawdust of resinous trees should on no account be used for this purpose, as it is never entirely free from a resinous smell, which gives the fruit a disagreeable flavour. It might, however, be used for packing fruits in that are to be sent to a short distance; but each fruit, previously to being immersed in the sawdust, should be well surrounded with linen or paper.

PAPER.—This material is employed for preserving fruit, but it becomes expensive when there is a large quantity to be preserved. If charcoal or sand are used, this and all other covering may be dispensed with.

BOG-MOULD.—I have been informed that this has been tried for preserving apples during winter, and that it is found to answer the purpose; but, having little experience with it, perhaps some correspondent that has used it will favour me with the result.

BEECH AND HAZEL FLOWERS.—I can recommend the use of these for packing and preserving fruit, especially the more delicate kinds. They answer well for packing grapes, peaches, etc., first putting in a layer of the flowers, and then a layer of grapes or peaches, until the box is full. The fruits will be found as fresh at their journey's end as when first put in, with the exception that the bloom of the

grapes will be destroyed. However, it may be renewed by dusting some fine flower over the berries, holding the bunch by the stalk or stem during the operation. Beech and hazel flowers can easily be procured. They should be collected soon after they have fallen from the trees, and put into an airy room to be thoroughly dried before they are used.

BRAN.—When this material can be procured, it will, perhaps, answer equally as well as the former; and, being of a finer nature, it will more readily fill up the crevices between the fruit.

CANVAS.—This material has been strongly recommended by some, with a view to prevent any dust from settling on the fruit. It also tends to prevent their evaporation, by preventing the air from acting on them.

SEALING-WAX.—This is much employed in France, and other parts of the Continent, for preserving pears. It is applied by sealing up the end of the stalk as you would seal up a letter, only not putting quite so much on. In this way fruit is preserved for some time.

HAY, STRAW, AND FERN.—These have been used for a long time for covering pears and apples in the fruit-room, and likewise for packing; but I consider them coarse for packing, when other materials of a lighter nature can be procured.

PITTING.—Apples may be kept in pits after the manner of potatoes; we have seen this practice both in France and England with success; but the fruit does not keep long after it is taken out; consequently only a small quantity should be taken out at one time, and the pit should be instantly closed up, to prevent the admission of air. Apples in this manner will be found quite sound and good in the months of May and June, or even July, if they have been pitted in a careful manner, all bruised ones being rejected, which would destroy the others. A little powdered charcoal should be carefully sifted over the apples as they are laid up, which should be done in regular layers. The charcoal absorbs any moisture that is given off by the apples, and keeps all cool. After this is done, take some clean wheat-straw, or hay, and lay it over the fruit, to the thickness of a foot, fastening it down with ropes made of the same material, then cover them up with earth to the depth of another foot. The covering will prevent any change in the atmosphere from reaching the apples. The operation should be performed in dry weather.

Preserving fruits on detached shoots has been adopted with but little success. The experiment was tried with grapes, which were detached from the main branch, a piece of the shoot, about a foot long, being cut with the bunch. Some were immersed in bottles of water, others were suspended in the fruit-room, and part were left on the shoots in the vinery. It was found that those in the vinery kept as long as the others. A good plan is to cut the bunches, and turning them upside down, suspend them in a room with a steady temperature a little above 32°. Another method is to cut off the bunches, with a foot of the stem on each side of the bunch, sealing up the cut ends with sealing-wax, and suspending

the bunches in the above-mentioned temperature. The following is a good way of preserving ripe grapes:—Procure some tin cases of any convenient size, and put in a layer of dry sand or charcoal, and then a bunch of grapes, until the case is full; seal down the lid and make all air-tight, and bury them to any convenient depth in the ground. This plan will likewise answer for late cherries, plums, gooseberries, currants, etc. These fruits in some gardens are retarded in their time of ripening by being covered with mats or nets, which is an excellent plan, and ought to be more generally adopted, as it insures a succession. Grapes, peaches, apricots, in the open air, may be kept for some time hanging on the trees after they are ripe by the same means, but their flavour will not be good. Red and white currants in the same manner will even keep good till the end of December. Ice-houses have been recommended for preserving fruit; but they are objectionable, on account of the moisture which they contain. A dry, cool, and airy room, free from all atmospheric changes, is the only place where fruits can be preserved for any length of time. It will be found that some of the finer sorts of pears and apples are liable to crack before they are quite ripe; therefore they should always be gathered and taken into a hothouse, in order to ripen them as quickly as possible. It often happens that one half cracks while the other remains sound. Those that are sound should remain on the tree until the proper time for gathering them arrives, which is known by gently lifting them up, and then letting them down with a slight jerk; if ripe, they easily detach. I have seen the following plan adopted with success:—When ripe fruit was wanted before it had arrived at proper maturity in the open air, those were selected which appeared to be ripest; they were placed in a hot-house, and suspended over the hottest part of the flue in a basket, till they were fit for use; the remainder was left on the trees for a succession. The ripening of peaches, nectarines, apricots, plums, cherries, strawberries, gooseberries, currants, etc., may be accelerated in this manner with the utmost advantage. I am not aware that any method has been adopted for the preservation of the pineapple for any length of time. I have seen it cut up and immersed in bottles containing spirits—as brandy, whisky, etc., to which it imparts a pleasant and delicious flavour; plums, cherries, and apricots are used for the same purpose in France. The sweating of apples is not to be recommended, as the flavour of the fruit is much deteriorated by it. The less fruit is handled the better, and the less it is exposed to atmospheric changes, after being gathered, the longer will it remain plump and sound, without becoming dry and mealy.

GREEN FRUITS for preserving, must be gathered when quite dry. Having provided some wide-mouthed bottles, or tin cases, commence by cutting off the berries, one by one, from the stalks till the bottles are full; cork them up tight, and seal them over with some wax, then place them in some cool, airy room; or, what is better, plunge them into the open ground, surrounding each bottle with some charcoal, or dry sand.

SHELL FRUIT, as walnuts, nuts, chestnuts, etc., may be preserved

for a year or two by being divested of their outer shell, and thoroughly dried. In jars, or tin cases, put in a layer of charcoal or dry sand, then a layer of nuts. Proceed in this way until they are full, properly securing each lid, to prevent the admission of air; when finished, bury them in the open ground, or in some cool and dry cellar.

POT CULTURE OF THE HYACINTH.



ONE of the most important points in the culture of the Hyacinth is to select hard, sound, well-ripened bulbs, for fine spikes of bloom cannot be had from those that are soft and spongy, even if they are of large size. Good turfy loam and well-decayed manure, at the rate of three parts loam to two of manure, chopped up roughly, and mixed with a sixth part of silver sand, form a capital compost for hyacinths. Use five-inch pots, and let them be well drained, by placing a layer of crocks in the bottom. Put one bulb in each pot; press the soil slightly firm in the pots, and when they are filled to within an inch of the rim, insert the bulbs and fill the soil firmly about them. The neck of the bulb should show just above the soil. When they are simply placed on the surface, with a little loose soil about them, the weight of the spike will probably topple them over. The soil should be used in a moderately moist condition, and then no water will be necessary until they come from the plunge-beds. When all are potted, make up a good bed of coal-ashes, and stand the pots upon it. This done, turn a small sixty-pot over each bulb, and cover with coal-ashes, spent hops, or cocoa-nut fibre refuse, to the depth of six or eight inches. Here they should remain for five or six weeks, and then be brought into the forcing-house as wanted. The young growth must be inured to the light in a gradual manner, and the plants kept near the glass. After they are well started into growth, water liberally, and let them have a breath of fresh air during the warmest part of the day; but it must be admitted without chilling the tender growth.

The bulbs must not be left in the plunge-bed long enough for the foliage to grow long and become blanched. Therefore, when the flowers are not wanted until late in the spring, lift them out of the plunging material and place them in a cold frame or pit, where light and air will have free access to them. Those for early flowering must not be exposed to a great heat, or the flower-spikes and foliage will be drawn up weak and spindly; and at all times keep as close to the glass as possible, because neat, properly-developed foliage, that will maintain an erect position without support, is nearly of as much importance as good spikes of flowers.

It is a waste of time to pot hyacinth bulbs a second season, and, therefore, to secure an annual display there must be an annual purchase. But the bulbs may be turned to good account in another way. When the flowering is over, put them in a cold pit or frame, and take reasonable care of them until they are beginning to die down. Then plant them all out, without breaking the roots in the

shrubby or hedgerows, and forget them; they will in time remind you of their existence, and supply you with welcome garlands of bright and fragrant flowers.

REMINDERS FOR GARDEN WORK IN SEPTEMBER.



URICULAS must be picked over and relieved of their decayed stalks and yellow leaves, and at the end of the month be placed in their regular winter pit or frame, have but little wet, and all the air they can.

PLANTS in the borders that are to be saved in pots should now be removed, and for want of better accommodation, dig a pit deep enough to hold them, and cover it over with boards; remove all you can to the dwelling-house.

CARNATIONS and **PICOTTEES**.—Where the layers are struck, they should be cut off and potted in 48-sized pots, one pair in each, in fresh sandy rich loam, but no dung; nothing equals the top spit of a meadow or pasture with the turf rotted in it, but every bit should go through the hand, to make sure there is neither wireworm nor grub; in cutting off the layer, the portion attached to the plant should be cut off at a joint; the pots must be one-third full of crocks, to make the drainage clear.

BULBS.—This month may be said to be the beginning of bulb planting for early bloom; and all the soft kinds, such as lilies, crown imperials, etc., must be but a short time out of the ground.

CALCEOLARIAS are propagated by offsets and cuttings. Offsets should now be taken from the plants and potted; cuttings which have been struck should also be potted into single pots.

China, and **Tea-scented**, and most of the smooth-barked kinds of **ROSES** may be cut in, and the cuttings will strike by only keeping them in the greenhouse, or under a hand-glass, or in a pit free from frost through the winter.

DAHLIAS, as before, only towards the end of the month earth them up well to keep the frost from the roots.

TENDER GREENHOUSE PLANTS must be housed in many situations before the month is out, therefore see that all broken glass of pits, lights, hand-glasses, and greenhouses is mended, and all repositories of plants are cleared previous to removing the plants into them.

HARDY ANNUALS which shed their seed in profusion, and produce plants which stand the winter well, have induced many to make this month a season for sowing all kinds; and if they are well up and established before the winter sets in, many will stand well and form a double season with those sown in spring.

FRUIT must be gathered in dry weather, and if possible, when the sun is powerful; it makes a remarkable difference in the period of their keeping.

POTATOES that are ripe may be taken up and stored; they are always ripe when the haulm is decayed. They may be stored in a dry cellar covered over with straw, or in pits covered over with straw and mould.

TO CORRESPONDENTS.

DOUBLE PETUNIAS.—*Kilgobbin, Limerick*.—It is probable that you treat your Petunias too well; rich soils do not agree with them; and it is also probable that you give them too much water after the flowering season. The plants should be wintered in a dry, airy house, always safe from frost, and with no more water than just sufficient to keep them green until spring returns.

PELARGONIUM LEAVES.—*A. E. M., West Cowes*.—Your plants are evidently suffering from the ravages of some insect. Have you tried fumigation or forcible syringing?





TULIP.—PRINCE ALBERT.

THE CULTIVATION OF THE TULIP.



AS a border flower the tulip has but one fault—it is short-lived. Of its splendour and variety we need say nothing—better is it we should make good use of what little space we can afford to say and prove that there is nothing in the catalogue of border flowers to equal the tulip in cheapness, adaptability to a variety of circumstances, hardiness, simplicity of management, and capability to make a liberal return for every reasonable outlay. Once become possessed of a variety worth growing, if the stock consists of but one bulb; and it not only need not be lost, but will be sure to increase yearly with the most trifling exercise of care and judgment on the part of the cultivator. Any ordinary good soil will grow tulips well, but the best possible soil for them is a well-drained, very rich and mellow sandy loam. Partial shade they bear well; indeed, it is the custom to put an awning over a bed of named late tulips, both to prolong the beauty of the flowers, preserve their true colours, and enhance the enjoyment of inspection, for a good bed of tulips is an exhibition in itself. For ordinary purposes, all the several classes and sorts of tulips may be treated in the same manner, and they will all flower superbly, and increase rapidly, and maintain their quality, though the circumstances they are subject to may not be such as a tulip-fancier would approve. Indeed, for the parterre and the mixed border no one needs expensive kinds; at the same time, those who have first acquired some experience in the management of the cheapest will be well prepared to plunge into the tulip fancy, if so minded; and they might do worse.

The early tulips are the most useful for massing, because they may be taken up in time to make the beds ready for geraniums and other summer bedders. They should be planted in October, four inches deep and six inches apart, and be taken up as soon as their leaves begin to wither, at the end of May. It is not necessary to wait until the leaves have quite died down; if they are but half dead, the bulbs may be lifted and laid aside, with a thin covering of earth, for a week, to ripen for storing. The late, or exhibition tulips, should be planted in November, and taken up in June, when the leaves begin to die down. It is no easy matter to kill tulips. We remember sending a valuable collection to the other side of the world, some twenty-five years ago. They were delayed in transit, and our calculations were upset. The result was, that nearly a year elapsed from the time they were taken up in England to the planting of the roots in the colony. Then when the boxes were opened, it was found that the bulbs had shrivelled away to dust, but every one had formed a cluster of tiny offsets to take its place, and from these offsets our friend soon obtained stocks of the several varieties that were sent out to him. Some years ago, we were so much occupied with big work, that the planting of our tulips was deterred and deferred, until at last the 2nd of April arrived, and they were found much shrivelled and half-grown in their several drawers in the seed-rooms. On

that day we planted about three thousand bulbs on a piece of rough ground in the kitchen garden. They had scarce a drop of rain (for it was a season of drought), and were never watered nor weeded. At the end of June they were taken up and stored away. In the month of October following they were planted in the flower garden, and in the following season made a glorious display. Again, a lot of early tulips, hyacinths, and narcissus, bought in the autumn, were unavoidably neglected until the 1st of March, when they were all planted in the kitchen garden to "save their lives." They all bloomed well the following season, but a great batch of crocuses, planted at the same time, nearly perished.

The late or show tulips are well adapted for borders, in which they can be left for several years; but they are not adapted for the parterre, because they cannot be cleared away in proper time for the planting of the summer bedders which should follow. When grown in proper florists' fashion, they are planted in beds four feet wide, the sorts being arranged so that they graduate in heights from



TULIP BED.

the sides to the centre, as in the subjoined figure. A bed of sixty rows of good named show tulips—that is 420 bulbs in all—may be obtained for £20; and as for the early tulips, the prices of the very best range from ten to thirty shillings a hundred.

A SELECTION OF TWO HUNDRED SHOW TULIPS.

The following is a list of 200 cheap first-class sorts, which every beginner should possess, as they stand in the foremost rank at all our great exhibitions:—

BIZARRES.—*First Row:* Albion, Dr. Horner, Goldham's Fortunius, Golden Fleece, King of Tulips, Marshal Soult, Osiris, Roi de Navarre, Groom's Rubini, Sir Edward Codrington, Lawrence's Solon, Lawrence's Selim, Stein's Napier, Telemachus, Clarke's Ulysses. *Second Row:* Ariadne, Apollo, Bizard Le Kaine, Coronation, Charbonnier Noir, Captain White, Darius, Lawrence's Glencoe, Gloria Mundi, Lawrence's Ostade, Optimus, Lyde's Oddity, Pilot, Lawrence's Peacock, Strong's Titian, William IV. *Third Row:* Carter's Leopold, Charles X., Captain Sleigh, Delaforce's King, Lawrence's Fabius, Lord Strathmore, Lord John Russell, Magnum Bonum, Milton, Ophir, Polyphemus (feathered), Polyphemus (flamed), Prince of the Netherlands, Strong's Hero, Sala-

mander, Walker's King. *Fourth Row*: Dickson's Duke of Devonshire, Lawrence's Donzelli, Emperor of Austria, Lord Collingwood, Proteus, Sharp's Victory (*alias* Sultan), Lawrence's Sheet Anchor, Warsaw.

BYBLOMENS.—*First Row*: Bienfait, Chellaston Beauty, Euclid, Gloria alborum, La Belle Narine, Parmigiana, Goldham's Prince, Queen of the North, Strong's Claude, Gibbon's Purple Perfection. *Second Row*: Lawrence's Friend (*alias* Addison), Brown's Wallace, Bijou des Amateurs, Blomart, Cleopatra, Countess of Harrington, Lawrence's Diogenes, Euterpe, Gibbon's Enchantress, Grand Monarque, Irlandois, Ivanhoe, Joseph Strutt, Lalla Rookh, Lewald, La Virginité, Lawrence's Lord Stanley, La Jole, La Latière, Malibran, Maid of Orleans, Mentor, Gibbon's Purple Perfection, Penelope, Prince Charles, Reid's Prince Albert, Wilmer's Queen Victoria, Queen Charlotte, Rubens, Smith's Wellington, Superb et Noir, Victoria Regina, Violet Blondeau, Violet Rougeâtre, Winifred, Zoe. *Third Row*: Acapulca (*alias* Roi de Siam), Gibbon's Britannia, Black Baguet, Cincinnatus, Colossus, Desdemona, Duc de Bordeaux, Duc de Boufflers, Gibbon's Elegans, Franciscus Primus, Grotius, Grand Sultan, Holme's King, Lawrence's Lady Errol, Lawrence's Lord Hawkesbury, Michael Angelo, Miss Porter, Princess Charlotte's Cenotaph, Princess Royal, Lawrence's Patty, Lawrence's Priam, Tintoret. *Fourth Row*: Ambassador, Alexander Magnus, Lawrence's Camarine, Captain Lampson, Commodus, Lawrence's Elthiron, Louis XVI., Saint Paul, Thalia, Violet Quarto, General Barnovelde, Hugobert, Lelot Sovereign, Lilies' Grand Vase, Pass Salvator Rosa, Carter's Regulator, Wood's Rembrandt, Sir H. Pottinger, Gibbon's Surpass Le Grand.

ROSES.—*First Row*: Scarnell's Bijou, Cerise Blanche, Catalina, Fleur des Dames, Kate Connor, Madge Wildfire, Rose, Juliana, Lady Diana Boyle, Lachesis, Lady Wildair (flamed), Ondine (feathered), Groom's Persiana, Rose mignon. *Second Row*: Aspasia, Andromeda, Cerise à Bella Forme, Comet, Lawrence's Cymba, Duchess of Newcastle, Groom's Duchess of Sutherland, Dutch Ponceau, Slater's Fairy Queen, Goldham's Maria, Lawrence's Lady Waldegrave, Clark's Lavinia, Mary Lamb, Mason's Matilda, Perle Brilliant, Perle d'Orient, Rose Imogene, Triumph Royal, Strong's Duchess of Kent, Lawrence's Emily, Willison's Juliet, La Belle Nanette, Ponceau-très-blanc. *Third Row*: Lawrence's Anglia, Anastasia, Claudiana, Lawrence's Duchess of Clarence, Fanny Cerito, Lord Byron, Rose Camuse, Rose Brilliant, Rose Galatea, Lawrence's Mary Anne, Rose Cordelia, Rose Walworth, Thalestris, Hayward's Magnificent, Vicar of Radford. *Fourth Row*: Lawrence's Clarissima, Count de Vergennes, Lawrence's Emily, Madame Vestris, Mountain Sylph, Midland Beauty, Prince William IV., Rosa Blanca.

BEST THIRTY BEDDING TULIPS.

Red: Cramoisie, Vermilion Brilliant, Couleur Cardinal, Monument, Feu d'Anvers, Zongloed, Van Thol.

Yellow: Marquis de Nesselrode, Yellow Prince, Yellow Tournesol, Yellow Rose, Grenadier, Yellow Pottebakker.

† October.

White : Alida, White Pottebakker, Jagt van Delft, Luna, Nonsuit.

Various : Roi Pepin, white and crimson ; Duc d'Aremberg, crimson and gold ; Florida, deep mauve ; Keizerkroon, crimson and gold ; Thomas Moore, yellow and buff ; Van der Neer, puce ; Prosperine, crimson ; Bonaparte, chocolate.

Double : The best doubles for a group are La Candeur, Rex Rubrorum, Tournesol, Yellow Rose.

THE BULB GARDEN.



OW is the time for laying in a stock and planting ; the latter operation, indeed, should be no longer delayed, for it is desirable every bulb should be well rooted before winter. Nature is a sure instructor in this duty of early planting ; for keep them where you will, bulbs now give signs of life. Hyacinths, tulips, and crocuses are developing their leaf-buds, and unless the formation of roots keeps pace with the growth of foliage, the future plant will suffer. I have generally observed in gardens a great parsimony in reference to bulbs in the open air ; they are planted too far apart, and there are too few of them to make a good display. Yet what can better repay all the labour and money expended on them ? How dull will the garden be for many months if this interesting class of flowers is neglected. The growth of bulbs is indeed a winter and spring study, and a most beautiful style of gardening has been enjoyed and has disappeared before the beds can admit the tender exotics which are to adorn them in summer and autumn.

My advice is, to be generous now. If you can afford to do so, buy crocuses by thousands, and tulips and hyacinths by hundreds. Remember they are all very fond of increase, and with care your outlay will come back with interest. But be careful how you buy. Go to a respectable florist and not to auctions, and lay in a stock of healthy and sound bulbs, and next season you may calculate on adding seventy-five per cent. to your collection, without reckoning small offsets. Crocuses and tulips multiply without much trouble ; and I have found by some years' experience that hyacinths may be successfully propagated here as well as in Holland. Quantity is indispensable if you would be a bulb amateur in the garden, and the outlay of a few pounds will make you the envy of your neighbours, and become a source of profound enjoyment to yourself. There are many other bulbs besides those I have mentioned, which ought not to be neglected, and the above kinds are only adduced as examples. These bulbs may be grown in beds or in borders, according to room and circumstances. Have, at any rate, one bed appropriated to crocuses, that your eyes and heart may be gladdened, when in January or February a kindly sun calls forth their gorgeous beauties. Let this bed, intended for early effect, have every advantage you can give it, sloping towards the south, well drained, and composed of friable, generous mould. Such a bed may have a few early tulips

and hyacinths mixed with the crocuses, that when the latter are off, it may still be attractive. But probably the borders will generally be preferred to separate beds, and then the following plan will be found advantageous.

Let the outer row be composed of crocuses, the next of hyacinths, and the third, or inner row, of tulips. You need not be afraid of planting too thickly, but let there be two or three inches space between each kind of bulb. The crocuses will be off the bloom by the time the hyacinths are in their prime, and the foliage, long and pendent, of the former will make a pretty fringed border for the latter. Oval or round beds have a fine effect when planted in this way; the beauty is prolonged, and the whole may be cleared away in time for the spring bedding-out of the greenhouse exotics. In planting, dig a trench about four inches deep around the bed, and as wide as you require it. Let the bottom be well loosened, and then place the bulbs in order upon it. Cover with about half an inch of rotten leaf-mould and sand, if you have prepared any such precious compost, and then return the mould first thrown out. During the winter be careful of the ravages of mice, for they often devour thousands of crocuses and tulips before they are observed. The crocuses may be mixed, or planted in alternate rows of various colours. The same plan may be pursued with the hyacinths.

For planting in the open air, purchase the mixed sorts, sold at three shillings a dozen, single and double white, red, and blue. These mixtures generally contain many fine sorts. Snowdrops, crown imperials, narcissus, etc., may be placed in clumps in various parts of the beds, bordered in the manner just described, and, thus furnished, wait with patience till the first warm suns of spring call your beauties above the ground.

INDIGOFERA DECORA.



THIS is an exceedingly useful plant for decorative purposes. It soon forms a large specimen, and flowers abundantly for several months in succession. Cuttings made of short-jointed bits of young wood in a half-ripe state (which are readily obtained from growing plants in autumn), inserted in light sandy soil, and set in a close place, soon emit roots, and may be allowed to remain in the cutting pot until spring, or potted off and established in small pots, as may be most convenient.

In February, or as early in spring as convenient, place the young plants in a moist growing temperature of from 50° to 60°, and sprinkle them frequently with the syringe, to induce them to start into growth. As soon as active growth commences see to the state of the roots, and give a liberal shift, if the pots are moderately filled with healthy roots, say into pots two sizes larger; but unless the roots are in an active state, defer potting until such is the case. Apply water cautiously for a fortnight or so, until the roots lay

hold of the fresh soil, after which a liberal supply will be necessary, and the syringe should be used morning and evening to keep the foliage in a clean healthy state. The plants had better not be subjected to a higher night temperature than from 50° to 55° , and they should be removed to a cold frame as soon as the weather will admit. If the frame is placed so as to be screened from the midday sun, the plants will be less liable to the attacks of red spider, and unless such is the case, a thin shade should be thrown over the glass on the forenoons of bright days. This *Indigofera* is a vigorous grower, and healthy plants will require a second shift; they will probably be ready for this early in June, and it should not be deferred after it is wanted, otherwise the growth of the plants will be checked, and it is desirable to have the pots well filled with roots before winter. Very little attention will be required in training the specimens in any desired form. The branches should be held up at regular distances apart, so as to admit light and air, and any shoot which inclines to take a decided lead must be stopped, so as to maintain a compact and regular form of growth. After about the middle of August the object should be to ripen the wood, and to effect this it will be necessary to expose them freely to sun and air, and to lessen the supply of water at the root. When damp weather occurs, unless the wood is well matured, remove the plants to the front of the greenhouse, or to any airy position, where the ripening of the shoots will be completed. Plants the growth of which is properly matured will winter safely anywhere out of the reach of frost, and a few degrees of this will not injure them, but improperly ripened wood is apt to damp off; therefore it is worth while being at some trouble to get the young shoots thoroughly matured previous to the damp, foggy days of November. Water should be altogether withheld while the plants are in a dormant state. In cases where it is desired to obtain large specimens without loss of time, the plants may be placed in growing circumstances early in spring, taking care to bring the soil into a moist, healthy state, and to keep the foliage clean and healthy.

By attention to potting, etc., during the season, as recommended in our last, large specimens will be obtained previous to winter. The treatment under which I have found full-grown specimens to flower most profusely, and continue the longest in perfection, is to keep them dry at the root during winter and till late in spring, and thoroughly moisten the soil, letting the plants occupy a place in the closest part of the greenhouse, and moistening them overhead frequently, until they commence flowering, which may be about June or early in July, according to the time at which they are started into growth. By giving a liberal supply of manure-water during the period the plants are in bloom, and keeping them in a close part of the flower-house, they will go on growing and flowering in great perfection for some two or three months in succession, and few plants are more handsome than large well-bloomed specimens of this *Indigofera*. A moderate shift should be afforded the specimens annually as long as this can be conveniently done; and when the size of the pots renders this impracticable, the balls may be reduced,

and the plants repotted in the same sized pots, using rich fresh soil. The best time for disrooting the plants is after their beauty is over in autumn, and they should be afforded a close growing atmosphere for a fortnight or so after potting, to induce the roots to strike into the fresh soil, after which they may be removed to their winter quarters. Good rich turfy loam and decayed leaves form an excellent compost for the growth of this plant. The loam should be broken into moderately small pieces, rejecting all but the prime fibry portions, and be well intermixed with the leaf soil, adding about one part in four, and a proportionate quantity of sharp sand, according to the nature of the loam, and a sprinkling of lumpy pieces of charcoal or broken potsberds will also assist in keeping the soil open and ensuring perfect drainage.

ACROPHYLLUM VENOSUM.



THE finely serrated bronzy-coloured foliage of this plant renders it a pretty object at all seasons of the year, and when seen in the form of well-flowered specimens, it has a very striking effect. Unfortunately, however, it is very impatient of improper treatment, and must be allowed to be rather difficult to manage successfully. Its culture, however, is not so much a matter requiring any particular skill as careful and constant attention, and with this any grower of moderate experience may produce moderate specimens. Short-jointed, rather firm bits of the young wood, slipped off with a heel and carefully managed, are not very difficult to root; but beginners will save time, and probably disappointment, by procuring nice dwarf, bushy, healthy young plants from the nurseries. These, if procured at once, should be considered to have completed their growth for this season, and should be placed near the glass in the greenhouse, or a well-ventilated pit, taking care, however, not to expose them to cold drying winds. During winter, water must be very carefully administered to the soil, for if this ever gets sodden, the plant will be ruined; and although it may linger for a while, it will be only to excite hopes which will never be realized. Therefore endeavour to keep the soil in a healthy state as to moisture; but let it be bordering upon dryness, for any little excess in this direction is not so likely to be injurious as the opposite extreme. About the middle of March young plants may be induced to start into growth, by placing them where the night temperature is maintained at from 40° to 50°, allowing it to rise some 10° with sun-heat and a circulation of air; but there must be no approach to forcing, and the heat should be maintained as much as possible by shutting up early in the afternoon, for it would be very unsafe for beginners to subject this plant to much artificial heat. Keep it near the glass, and maintain a nice moist atmosphere by sprinkling the passages, etc., as often as may be necessary, and lightly syringe the plants overhead on the after-

October.

noons of fine days. If the plant has several shoots, these should be nicely spread out, and the points of the longer ones pinched out in order to secure compact growth; but do not stop too freely until growth has fairly commenced. As soon as the buds are perceived to be pushing, examine the state of the roots, and if the ball is well covered with healthy, active roots, give a moderate shift; but avoid shifting unless more pot room is really wanted. Also be careful to have the ball moist, and the soil to be used in a healthy state; and water very carefully for a month or so after potting, keeping the atmosphere moist, and syringing overhead every fine afternoon, or oftener, where fire-heat is used. When growth fairly commences, be very careful not to expose the tender foliage to currents of cold drying air; but admit air freely on every favourable opportunity, and avoid keeping the atmosphere so warm as to induce weakly growth. From the middle of April to the beginning of May, according to the state of the weather, remove the plant to a cold frame, which, with a little attention, will be a much more suitable situation for them after this season than the ordinary greenhouse, or a house where fire-heat is used. If drying winds occur after removing the plants to a cold frame, give air very sparingly, raising the sash a little on the sheltered side, and use a slight shade to keep down the temperature; but during fine weather give air freely, and secure a thoroughly moist atmosphere by sprinkling the floor of the pit every morning and evening, and the plants overhead every fine afternoon, shutting up close for the evening, but give air for the night. As growth advances, attend to keeping the shoots nicely tied out, and stop, as may be necessary, to secure close growth. If a second shift is necessary, this should be attended to as early in the season as it may be wanted, so as to allow of getting the plants well rooted into the fresh soil before winter. As soon as cold damp weather occurs in autumn, remove the plants to a situation near the glass in the greenhouse, and treat them as directed for last winter. If it is intended to allow them to flower, they should remain in the greenhouse, and be slightly shaded while in bloom; but if it is intended to grow them another season before flowering, the shoots should be cut back, so as to remove the flower-buds, placing them in a situation where they can be kept moist, in order to encourage growth. Attend to potting as may be required, and otherwise treat them during the growing season as directed above, only stopping should not be practised later than June, as stopping later in the season would tend to cause them to flower weakly and irregularly. The plants will require to be slightly cut back, and to have their shoots tied out and regulated every season after flowering. For soil, use good rich fibry peat, selecting the very best pieces, and be careful to have it in prime condition as to age, etc. This should be broken up rather small, and intermixed with a liberal proportion of silver-sand and a sprinkling of lumpy bits of charcoal, or clean potsherds broken small. In potting be sure to secure perfect drainage, and make the new soil rather firm about the ball to prevent the water passing off through it too freely.

GESNERAS.



WHEN well-managed these are very handsome plants, which, owing to their accommodating habits, are particularly well-suited for amateurs, or persons having but small house-room. *G. zebrina*, which I need not say is one of the best of them, may be had in bloom at almost any period of the year; but it is most useful for autumn and winter flowering, and for this purpose few plants are more useful.

Like *Achimenes*, *Gesneras* increase sufficiently fast, by means of their underground tubers, to render artificial propagation unnecessary, at least in the case of ordinary growers. If it is desired to have flowering specimens in autumn and early winter, the tubers should be carefully separated from the soil in which they have been wintered, about the beginning of March, and planted rather thickly on the surface of well-drained pots or pans, filled to within about three inches of their surface with any light peaty soil, from which it will be easy to separate the roots without injury, and covered two inches deep. Give a gentle watering, to settle the soil about the tubers, and place them in a warm, growing temperature of about 65° or 70°. Until the plants appear above the soil no more water should be given than may be necessary to preserve the soil in a most healthy condition. As soon as the plants are from an inch to two inches high they should be separated and repotted. I use shallow eight-inch pots, and place five plants in each; but the number of plants in a pot should be regulated by the taste and convenience of the cultivator. With proper management one placed in a pot will form a very fine specimen; but, to effect this, more care and time are required than when five plants are put into a pot, and the latter form larger specimens than it is possible to obtain by having only one plant. After potting, keep the atmosphere close and moist, and give very little water at the root until they start into growth.

When the pots are moderately well-filled with roots, shift into the flowering-size. For single specimens ten-inch pots will be sufficiently large; when three plants are used, twelve-inch pots will be necessary, and thirteen-inch pots in the case of five plants. Keep close and moist, and carefully avoid over-watering till the roots can penetrate the fresh soil. A high temperature during summer is rather injurious than beneficial in the culture of this plant; 50° or 60° at night, allowing it to range 10° or 15° higher with sun-heat, will be most conducive to strong vigorous growth, and the production of handsome specimens. The plants should be placed near the glass, so that they may receive as much light as can be afforded them, but it will be found necessary to slightly shade them during bright sunshine, and the atmosphere should be maintained in a thoroughly moist state; but this must not be effected by excluding air and close shading, otherwise the plants will assume a sickly, drawn appearance, and the foliage will be thin and ill-coloured. The shoots may be neatly staked, as soon as they are

high enough to be liable to be broken. The stakes used may be cut off at the height of about fifteen inches, which will be sufficient for the support of most of the plants; the flower-spikes will require no support; and if the plants are kept near the glass, and frequently turned round, they, too, will probably need no staking, to cause them to assume the desired form. *G. zebrina* has a tendency, under high cultivation, to produce flower-spikes at the axils of the leaves, and it will generally form a more showy specimen in this way than if stopping is resorted to; but when only one plant is used as the foundation of the specimen, it may be advisable to stop once, when about four inches high.

An occasional watering with clear manure-water will tend very much to promote vigorous growth; but this will be unnecessary till the plants have pretty well filled their pots with healthy roots. When the blossoms begin to be developed, the plants may be removed to the conservatory or greenhouse; but they must be gradually prepared for the change. Great care should be used to prevent their sustaining any check, and they should be guarded from currents of cold air after their removal. A temperature of from 45° to 50° at night will be necessary during the whole of the blooming season, if the plants are expected to increase in size and beauty for some two months together. When they show symptoms of decline, water should be gradually withheld; and when the foliage and stems die down, the pots should be placed in a situation where they will be free from damp and frost; unless the tubers are well-ripened, they should not be placed in a lower temperature than 45° . A rich friable soil is essential to the production of fine specimens of *Gesnera*.

I find light sandy turfy loam, rich fibry peat, and thoroughly decomposed cow-dung, in about equal proportions, adding a sufficient quantity of sharp silver sand, to insure the free percolation of water through the mass, to suit well. The loam and peat need not be broken up into very small pieces; but the dung should be passed through a fine sieve, to catch the worms, which it almost always contains. I ought to state that there are two varieties of *Gesnera zebrina* in cultivation, the one having thin, ill-coloured leaves, and, in every way, much inferior to the other; therefore beginners should take care not to purchase the worthless variety, which, however, is fortunately not very common.

THE MIRBELIA.



MOST of the species of this genus are of a nice compact habit of growth, forming handsome specimens, and their pretty little flowers are produced very freely; hence they are well worthy of a place in the most select collections. Some of them are, however, rather difficult subjects to manage; but if proper care is exercised from the first, so as to avoid letting them get into a sickly state, they will be

found to grow freely enough. Short-jointed bits of the young wood selected in a rather firm state, and treated in the ordinary manner, root with tolerable certainty, and young plants are readily obtained from seeds. But well-propagated plants may be obtained for a trifle, and it is hardly worth while for beginners to attempt their propagation, which requires some time and careful attention if good young plants are to be produced. I will suppose that young plants are procured between now and March, and every care should be exercised to select healthy strong young samples with a bushy habit of growth, for future success will largely depend upon obtaining vigorous well-propagated plants.

About the beginning of March turn them carefully out of their pots, and if the balls are found to be well covered with healthy roots, shift into pots a convenient size larger, placing them after re-potting near the glass in the warmest end of the greenhouse, or in a pit which can be kept rather close. Sprinkle the plants overhead on the afternoon of bright days, starting up with a temperature by sun-heat of 55° or 60° , and endeavour to maintain a nice moist growing atmosphere, giving air freely on mild days, but guard against cold cutting winds. Also avoid as much as possible the use of fire-heat, and endeavour to coax the plants into early growth by carefully husbanding the sun's influences; for unless the temperature is proportioned to the amount of light, they will break thinly, and make weakly growth. Indeed, the temperature should never exceed 45° by means of fire-heat, and this should be accompanied by plenty of moisture. The shoots, if there are several to a plant, should be nicely tied out after potting, in order to prevent the flow of sap to the uppermost buds, and induce them to break close and regularly. Very little water will be needed at the root for some time after shifting, and this must be administered very carefully at all times, as the plants are very impatient of stagnant moisture at the root, and soon suffer from any neglect in this respect; but while in free growth they must not be allowed to suffer from the opposite extreme. As soon as the weather becomes mild, remove the plants to a cold frame, which will form the best and most convenient situation for them in summer. Here they should be afforded a free circulation of air on favourable occasions, and a slight shade against bright sunshine, keeping the atmosphere as moist as can conveniently be done. Sprinkle the plants overhead early on the afternoons of fine days, and shut the lights down for the evening, but give air before retiring for the night, and after about the middle of July, the lights may be thrown off at night when there is no danger of rain. As they advance in growth attend carefully to regulating the shoots, pinching out the point of any one that may incline to take a decided lead of the others, and keeping them nicely tied out. If all goes on well, a second shift will probably be necessary towards the middle of June, and this should be given as soon as it may be wanted, in order to get the plants pretty well rooted into the fresh soil before the winter. When the weather becomes cloudy and damp in autumn, discontinue the use of the syringe and shading, and keep the plants rather dry and airy, in

order to get the wood well ripened, and remove them to their winter quarters, which should be a light airy part of the greenhouse, before there is any danger of their suffering from damp or cold. In winter, and while in a dormant state, keep them rather dry at root, and guard them from cold winds, but give plenty of air on mild days. To obtain specimens of any size it will be necessary to afford them another season's growth, and in this case the shoots should be cut back as much as may appear requisite to ensure a close bushy habit of growth, and the plants placed in growing circumstances early in spring, treating them during the season as already recommended. But if the plants are to be allowed to bloom, they should be left in the greenhouse until the flowers open, and may then be removed to a cool airy part of the conservatory, carefully shading them from bright sunshine, to prolong the beauty of the flowers. After flowering, cut the shoots back to keep the specimens compact and bushy, and place them where they can be afforded a cool moist atmosphere until the buds start into growth; then give a moderate shift if necessary, and treat them during the growing season as nearly as possible as recommended for young plants; for free growth need hardly be expected without the assistance of a moist, rather close, atmosphere. For soil, use the very best fibry peat that can be obtained, breaking it up into small lumpy bits, and adding a liberal proportion of sharp silver sand, with a small quantity of lumpy bits of charcoal or clean potsherds. Well inter-mix the whole together, so as to provide for the free percolation of water through the ball after the decay of the fibre; and in potting care should be used to provide perfect drainage.

COMBRETUM PURPUREUM.



HERE space in a warm house can be commanded, this forms a most useful subject, producing its large feathery-like panicles of bright crimson flowers, which last long in beauty, very freely. It is useless, however, to hope to do any good with it except where room can be at command to grow large specimens; for the flowers are seldom borne freely only upon the lateral, or second growths, and to have these strong and short-jointed, which should be the case, it is necessary to train the principal shoots thinly, and the plant being a free grower, a large sized trellis is indispensable.

This Combretum is generally found by amateurs to be rather difficult to propagate, but this is doubtless the result of not selecting fit pieces for cuttings; for short-jointed firm bits of young wood, treated in the ordinary manner, root very freely, and these are easily obtained from pot-bound specimens. The cuttings should be potted singly in small pots as soon as they are sufficiently rooted, plunging the pots in a brisk bottom-heat, in a warm moist situation.

When well established, shift into pots about two sizes larger, and during the growing season afford the young plants a bottom-heat of

85° or 90°, with a warm moist atmosphere and all the light possible, merely shading them from direct sunshine on the forenoons of bright warm days. Endeavour, however, to get the cuttings rooted early in the season, so as to have them well established and some size before winter; for it is not desirable to keep them growing after the beginning of November, for after that they should be treated with a view to getting the wood well ripened, placing them in an airy part of the stove and keeping them rather dry at the root. And it may be observed, that in the case of either young or old plants, it is necessary, in order to secure strong growth the following season, to thoroughly ripen the wood and afford the plants a period of rest, placing them while in a dormant state where a temperature of about 55° may be maintained by means of fire-heat. As early in spring as circumstances will permit, cut the back wood to prominent eyes, and train the shoots nicely, keeping the points rather low; and remove the plants to a warm growing temperature, placing them near the glass, and giving sufficient water to the soil to bring this into a healthy moist state. Syringe overhead on the afternoons of bright days, and if convenient to plunge the pots in a mild bottom-heat, this will greatly assist in getting the buds to break thickly.

In the case of young plants, a small shift should be given as soon as the roots become active, and old specimens, to which it may not be convenient to afford larger pots, may have the ball reduced sufficiently to allow of using a little fresh soil, repotting in the same sized pots. And with the assistance of a little manure water, and slightly reducing the ball every season, specimens will do very well for years in the same sized pots, and will flower more freely than if a luxuriant habit of growth were encouraged by giving large shifts annually. Young plants should, however, be shifted into the pots in which they are to be bloomed, as soon as this may be considered safe, in order to allow of training the shoots to the trellis on which they are to flower. Attend carefully to the wants of the plants during the growing season, keeping them near the glass, and properly supplied with water at the root; and when the weather becomes hot protect them from the mid-day sun by a thin shade.

When large well-furnished specimens are obtained, if they do not seem inclined to bloom freely they should be kept rather dry at the root for a few weeks, using the syringe only to prevent red spider gaining a footing on the foliage. This will check over-luxuriant growth, and greatly assist in promoting a flowering habit; but it will hardly be necessary to resort to any particular treatment in order to get well-grown specimens to bloom freely. While in flower the specimens should occupy a cool airy part of the stove, where the flowers will be safe from damp, and not exposed to bright sunshine. Or, if desirable to remove them to the conservatory, this may be done, provided they are gradually prepared for the change of temperature, and can be placed in a close warm part of the house. For soil use equal parts of good rich fibry peat and light turfy loam, adding plenty of silver sand to keep the compost porous after the decay of the fibre.

Fine as this *Combretum* is as a pot specimen when well done, it

October.

may be had in larger masses, forming more striking objects, where it can be planted out in the border of the stove and trained to the rafters, where it will bloom profusely for months in succession. It is, however, well known to be one of the very best of stove climbers.

STRIKING CUTTINGS.



THAT is required when cuttings of plants are to be struck, is a due adjustment of heat, light, and moisture. The first stimulates the vital process; the second causes the formation of matter out of which roots and leaves are to be organized; the third is at once a vehicle for the food required by the cutting, and a part of it. The great difficulty is to know how to adjust these agents. If the heat is too high, organs are formed faster than they can be solidified. If too low, decay comes on before the reproductive forces can be put in action. When light is too powerful, the fluid contents of the cutting are lost faster than they can be supplied; when too feeble, there is not a sufficiently quick formation of organizable matter to construct the new roots and leaves with. If water is deficient, the cutting is starved; if over-abundant it rots. It is, then, the adjustment of these varying forces to the peculiar nature of the cutting to be acted upon, that constitutes the art of propagation. It is this which theory cannot supply, but which depends upon skill and experience. If any part of the operations of cultivation can be called empirical, it is this. And yet the operator is not without rules to guide him in this adjustment. The misfortune is, that they are too general.

The softer a cutting, the quicker must be the excitement and application of the formative process; the more light, the greater the quantity of water. The more hard and woody a cutting, the slower will be the operation, the more feeble the light, the greater the quantity of water. If these conditions of new growth can but be preserved, all cuttings of all plants may be converted into new individuals. The great enemies of the propagator, says Mr. Neumann, are rotting and drying. For this reason cuttings are preserved in the midst of a temperature and humidity always equal, the evaporation of the soil is hindered, and the perspiration of the cuttings is prevented. Heat, light, and moisture being thus shown to be the agents to whose assistance we must look for success, and by whose mismanagement the hopes of the gardener are ruined, it is of the first importance to determine how each can be best and most efficiently controlled.

And first of heat. We know that plants are distributed over all parts of the habitable globe; that in neighbouring countries the species are nearly alike; that distant countries are clothed with vegetation of entirely different kinds; and that the distinction in the vegetation is in proportion to the distance of the countries from each other. There is not, perhaps, a dozen species in Normandy

that do not grow wild on this side the Channel; there is not a dozen species common to England and Bengal. Species, in fact, are in general limited by similarity of temperature, and cannot exist beyond such limits. One of the first considerations for the propagator, therefore, is what amount of heat is natural to a species during its season of growth. With less than that it is hopeless to make cuttings grow. It is only when plants strike freely that the natural amount of heat is sufficient; in general they require more. The amount of heat found in their natural climate may be enough for them to grow in; but a greater degree of excitement, by means of a higher temperature, will be demanded by them to strike root in, when cut up into the fragments called cuttings.

A willow cutting, stuck into the open ground, will strike root; but it does so much faster, and more vigorously, if placed in a hot-bed. A white-thorn cutting in the open ground will not root at all; in a warm propagating house it will do so readily. And, to reverse the illustration, cuttings of tropical plants, which naturally enjoy a very high temperature, will perish if it is reduced, and will only put forth roots when it is raised considerably above their natural standard. Thus Mr. Neumann mentions that nutmegs, guaiacum, mangoes, etc., will not succeed unless in a temperature of about 100° Fahr. That degree of heat, again, would be fatal to greenhouse plants. But it is not the temperature of the atmosphere that requires to be maintained above that to which plants are naturally subject—it is the soil that must be warmed. The first object is to obtain roots—those organs once formed, leaves will follow. The vital action which causes the production of roots is, in the first instance, local. Roots are produced by the development of the cellular matter of the underground part. That cellular matter requires to be stimulated by unusual warmth, but the necessary stimulus cannot be communicated by a heated atmosphere; it is the warmth of the soil in which the cellular matter lies buried, that must be secured. Unusual warmth of the air would have the effect of stimulating the buds, and would cause a premature appearance of leaves, which would be anything rather than conducive to the success of a cutting. If the soil were to be kept at 33° , and the air at 84° , leaves would form, but no roots would be emitted underground, however skilful the operator; and then, unless roots were thrown out above-ground, the cuttings would speedily exhaust themselves. On the other hand, if the soil were kept at 84° , and the air at 33° , leaves would certainly be formed as soon as the roots had struck out, although in a pinched and shivering condition. A proper degree of bottom-heat, then, is the first point for consideration; for all other processes are subservient to that fundamental requisite. And the rule is, that it should always be higher, by several degrees, than that to which plants are naturally subject. Unfortunately, we have very little evidence to show what that is; but a rough estimate of it may be formed by regarding it to equal the mean temperature of the summer. Hence the great value of good meteorological observations to gardeners. Suppose, for example, that it is required to strike a cutting of some plant from Algiers, and

that the mean temperature of the summer there were 70°—which is, we believe, about the truth—the safe course for the gardener to take would be to plunge his cutting into soil warmed up to 75°.

The action of light and moisture upon cuttings is hardly inferior to that of heat. Let us glance at their action separately. The moment light strikes a green plant, it excites perspiration. Let us imagine that a cutting weighed twenty at daybreak. The uninterrupted action of light upon it during the day would perhaps reduce its weight to five, unless it is supplied with water to replace that which the sunlight drives off. The effect of this would, of course, be to kill it.

But such a result does not often happen to rooted plants, because they are able to suck fluid out of the earth as fast as the sun drives it off from the leaves, and the circulation of the plant is active enough to prevent any part from being exhausted of fluid. If it is not sufficiently active, then we have leaves withered at the end, or branches struck with dryness. But a cutting, having no roots, is unable to contend against the sun's influence, and therefore it must be shaded; for, as we cannot make it feed, we must prevent its wanting food. Thus, in tropical countries we learn from Mr. Neumann that cuttings are struck in sheds shaded by straw, and watered occasionally; with us the same point is also gained by cutting off the leaves, or a part of them, for they are the chief perspiring organs. But there is this disadvantage in cutting off the access of light, that roots are formed more rapidly, when cuttings are exposed to light, than when they are shaded, provided they can be kept alive. It is, therefore, a great problem to determine how much light a cutting will endure with impunity. The power of bearing light varies from species to species, and is only to be determined by experience. One plant fades presently, because its powers of perspiration are very great, as is the case with the young shoots of most species of herbaceous and shrubby plants; but as they grow older the loss by perspiration diminishes, because their thickened skin opposes a mechanical obstacle, and they can bear more light. It would therefore seem, at first sight, that ripened cuttings must, in all cases, be preferable to those which are young and tender. Certainly, they are less liable to die quickly; but they are also much more unwilling to root quickly. In fact, notwithstanding the difficulty of keeping very young cuttings alive, they present the only means of striking very difficult species, such, according to Mr. Neumann, as the Cashew, the Mahogany, and the Litchie. We may lay it down as a certain rule that the power of rooting is always greatest in all cuttings when they are first pushing, provided they have light. The misfortune is, that they are so extremely perishable at that time. Water is our aid in this case. It is true that the sun's influence can have no injurious tendency so long as the roots can drink and the system digest as fast as the surface perspires; and that the reverse is fatal. But the whole surface of a plant absorbs as well as evaporates, and the younger it is the more it absorbs, it is therefore possible to give plants drink by their leaves; and if this is done with skill, the bad influence of the sun is prevented. In that case the

cutting has time enough to make roots, by which its grosser food may be conveyed to it. Hence has arisen the practice of striking plants under bell-glasses, fitting tight to the soil on which they rest. Ignorant people believe that the use of a bell-glass is to keep out air, which is impracticable and useless. Bell-glasses act by keeping in moisture. From the surface of warm, damp soil water is perpetually escaping in the form of invisible vapour; if the soil is freely exposed, that vapour is dispersed as fast as it is formed; but when it is confined beneath a bell-glass the air is unchanged, and the vapour remains in a state of suspension, bathing and invigorating the whole surface of the cuttings. If this is well managed the whole of the injurious effects of sunlight are prevented, and all the advantages of it secured. But it is not sufficient to place cuttings under a bell-glass with a moist soil and a due supply of bottom-heat. Two other things must be considered—the one is, to preserve the external air in a uniform state; the other is, to take care that the soil is not too wet. If the air on the outside of the bell-glasses is not as warm as that beneath them, or warmer, the moisture floating in their interior will condense on the sides of the glass and run down, by which means the air that surrounds the cuttings will fluctuate as to the quantity of water it holds suspended; and if the external air is much colder than the internal, will, in fact, be dry instead of damp. In their delicate state tender cuttings will not bear this; it is of the utmost consequence to them that all the conditions to which they are exposed, except light, should be perfectly steady.

The condition of the soil as to water, is also of infinite importance. If it is wet, cuttings are apt to rot. If dry, they are sure to fade. When a cutting is placed in a wet medium, it may attract more water than it can digest; in that case its fluids will become putrid and its solid fabric must decay. It is therefore indispensable, in all delicate operations, that the soil should be of such a nature as to be incapable of holding much water between its particles; and hence the value of silver sand, the most favourable of all the materials within a gardener's reach. Nevertheless, there are some hard-wooded plants which will not only bear an excess of water, but are the better for it. We have seen the common Ghent Azaleas struck by placing a cutting of the young wood with a heel to it, in a bottle of water, enclosed within a large Ward's case, none of the leaves having been removed.

In such plants as the azalea, however, it is to be observed, that the dense texture of the wood prevents the introduction of much water at a time, that the cuttings are very slender, and the leaves very large. Plants that are differently constituted can bear no such treatment. Let it be tried with a succulent plant, and the cutting would be rotten in a week. Succulent plants, indeed, will generally do best where there is no more moisture in contact with them than what the air holds suspended. When they are gummy, or milky, or resinous, it is necessary to let the end which is to be plunged in the ground become dry, so that the mouths of the veins may contract, and thus hinder the too rapid introduction of water. Mr. Neumann's mode of doing this is ingenious. When he takes off

cuttings of *Araucarias*, *Euphorbias*, *Vahea gummifera*, and such plants, he plunges them in a pot, in damp earth, not pressed down, with their lower end upwards, so that the latter only is exposed to the air, the whole head being buried. By this means he dries the wound, without allowing any of the water of such cuttings to escape. After leaving them for twenty-four or thirty-six hours, or even more, he wipes the end, so as to remove the gummy matter that has exuded, and then puts them in again in the usual way, when they take, and the more freely according as the wound is neatly made.

CULTURE OF STRAWBERRIES.



EW gardens, however small, are without a spot devoted to the growth of this favourite fruit, although very many persons fail of securing an adequate produce. This disappointment is attributed to many causes but the right one, which is, in general, an ignorance of the habits and wants of the plant. In most instances we find a bed appropriated to the strawberry, as ancient as that given to *Asparagus*, the treatment of which has been annually the same for probably fifteen or twenty years. The following is the routine generally practised by those who prefer "the wisdom of our ancestors" to abundant crops of fruit:—The young plants are set pretty closely in the first instance; the runners go where they please, and by the following autumn have formed a net-work all over the bed. The whole of the foliage is then moved or cut down, and a layer of dung thrown over the denuded plants prepares them for the coming spring. As there is no rule without exceptions, and nature *will* often be prolific, in spite of untoward circumstances, it happens that the owners of such beds sometimes tell you they have abundance of fruit. The rule, however, is, that under such discipline the strawberries grow "small by degrees and beautifully less," until the gardener is compelled to have recourse to remedy, and begin this ten or twenty years' course over again. Now the fact is that the strawberry, although capable of an indefinitely prolonged existence, by the production of offsets from the old stools, will bear well for only a very limited period, and the renewal of the beds every third or fourth year is the practice of all experienced gardeners. It is strongly recommended to amateurs to make a new plantation every year, and to dig up the beds every fourth season. Thus, if at the present time your garden has been arranged on this four-year principle, the following will be the state of your strawberry beds:—One is about to be dug up and planted with something else, or, what is far better, has been dug up since July, and is now covered with some growing crop; the second is just planted; the third is two years, and the fourth three years old. By this method a supply is secured without the loss of a year, as is the case when the whole stock is destroyed at once, and as by proper

management those just planted will bear next season, abundance of good fruit may be reckoned upon. As this is a good time for making new beds, the first thing to be done is to fix upon the sorts you intend to patronize. The varieties are very numerous, and fresh competitors for public favour are constantly appearing, so that there is room for caprice or experiment, or love of novelty. If neither of these impulses is very strong within you, and you feel that you can be satisfied with good tried sorts, take these three—Keen's Seedling, the British Queen, and the Elton Pine.

These are deservedly favourites, as having fine flavour and being plentiful bearers; they also come in in succession, which is a great advantage. If you have no old beds, you must procure runners elsewhere, with all the delay consequent upon having young plants with the roots exposed and somewhat dry. But if you have old beds, and have neglected to plant out the runners into a nursery bed in the summer, you cannot do better than adopt the following rules, which for several years have been found effective for securing good crops of this delicious fruit. Let the ground be well dug, and incorporated with good rotten dung from an old cucumber or melon-pit. I prefer growing strawberries in double rows, at the edges of beds in the kitchen garden, and I think the plan has many advantages. But, whatever mode you prefer, do not allow the plants to be more than two rows in depth, but interpose a path half a yard in width between every phalanx of two rows. The object is to have every plant distinct in the rows, so that air and light may be fully enjoyed, and runners may be easily cut off as they appear; and also that a space may be allowed wide enough to walk down the beds, to get at the fruit. Having your ground marked out with a line, proceed to the old bed, and take up the young plants which have rooted in it with a trowel. Choose those which appear to be most strong and established. Then dig holes with the trowel along your line, and carefully deposit the plants in them, about a foot apart every way. As the strawberry has, even in its young state, a vast quantity of root fibres, the process of taking up with a trowel preserves these, and prevents the plants being much checked by removal. By this process some fruit may be expected next year, although not so much as a more scientific plan would have secured. These plants, removed from an old bed, have been denied many advantages which a little forethought would have given them; they have been crowded together and shaded by the old leaves, so that they are not so fully developed as they might have been if the runners had been planted in a nursery bed in the summer as soon as they were old enough to be removed. As the treatment needed afterwards can be dwelt upon more usefully at the proper season for applying it, more need not be said upon the subject. If not done before, your old bearing beds should now be looked over. Remove all runners and dead leaves, but do not interfere with those which are healthy, as they have even now more work to do in maturing the future buds. A little dung may be laid upon the surface, and worked in with a fork, but do not let the prongs go too deep to interfere with the roots. I have sometimes

thought strawberry-beds are manured too highly, inducing too large a growth of leaf, to the injury of the fruit. One thing is certain with regard to vegetation generally, that, in proportion as you manure highly, you must allow more room. Turnips will bulb well when left thickly together on a poor soil, but, if it is rich, they must be hoed out to greater distances, or there will be nothing but leaf.

WINTER FLOWERS.



HOSE who desire to prolong—nay, to continue—the treasures of Flora, with as little intermission as possible, through the winter, must now make use of no small activity in retarding autumn flowers, and making provision for those intended for forcing. To this end the following remarks may possibly be of service to amateurs. I will pass by botanical rarities, and confine my observations to the more popular tribes, which, indeed, are far more adapted to the end in view. Foremost amongst these stands the *Primula sinensis*. In all establishments where winter flowers are desired, this holds a conspicuous place; and though by no means difficult to grow, yet to produce it at once with ease, certainty, and at the period when it is really wanted, requires certainly a little management. They are assuredly best from seed annually; two sowings, the one in March, the other in May, will suffice, under high cultivation, to furnish flowering plants from October to the following May, or even later. Those of the first sowing should have been prevented from flowering until the end of September, by constant stopping; these should now be well established in five and seven-inch pots, and the only conditions required henceforward to flower them well are total absence of frost, free watering, sometimes with clear liquid manure, and not too intense a light. The finest I ever saw were produced in a dark and damp old-fashioned greenhouse, the walls covered with various mosses in the most excellent health. The second stock of those intended for spring work should have their final shift in the course of September from three-inch to five and six-inch pots, according to the objects of the cultivator. They should have every flower picked off until the end of December, and will require, of course, the same conditions as to temperature, moisture, etc., as the early sowing. These plants, it is pretty well known, are exceedingly partial to leaf-mould. This, therefore, in a decomposed state, should form the bulk of the compost, to which may be added a little sound and mellow loam, a little peaty soil, a little wood-ash, and charcoal of the size of peas, and a good sprinkling of a sharp and lively sand.

The next popular tribe I would make a few remarks on is the *Cineraria*. This is scarcely second to the *Primula* for purposes of general decoration; these will do well from seed. However, as the seedlings cannot be relied on as to colour and character, it is better to raise them on the sucker system. The best plan by far is to turn

out the old plants (after undergoing a thorough cleansing process) into a raised bed, in the month of June. The bed should be composed of one-half leaf-soil, or other vegetable matter, with sharp sand; and if soiled up, pretty close to the collar, abundance of fine young plants will be ready for pots by the early part of August; they should then be taken up for general pottimg. They must be shaken entirely apart, and the plants singled out; those strong, put into three-inch pots; those weak, into thumbs; and the very weakest, pricked thickly into stove-pots for the latest spring use. Nothing is necessary but to place them all behind a wall, on the north side, immediately they are potted, and to sprinkle them well. The soil should be equal parts leaf-mould, peat, old cow-dung, charcoal, or wood-ashes, strong loam, and sharp sand, remembering in all these matters to drain the pots completely. These will want nearly the same treatment as the Chinese Primroses, only the latter revel in and enjoy both more light and air than the former. The most forward will require a shift about the first week of September—not later—into their final pots, using the compost in a rougher state. About the same time those in “stores” should be placed in thumbs, to receive their last shift about the end of January, whilst those potted in thumbs in August will want their final shift about the last week of September. By these means a constant bloom may be insured, from the first week of November until the end of the next May. These plants in the dead of winter like abundance of light and moderate waterings, but with the return of spring they require much water.

The Chrysanthemum holds a most important place amongst the autumn flowers; indeed, they may be said to form the great connecting link between the old year and the new. In endeavouring to simplify the cultivation of these gaudy flowers, I have found the one best plan to be, transplanting the cuttings when struck in the month of July, into beds in the open ground, placing them about eight inches apart. They remain thus until the middle of August (the grossest shoots being stopped occasionally), when they are potted at once into their final shift, and treated carefully as cuttings for a week or so, when they are inured gradually to the sunshine. It is well, however, to pot all the smallest and weakest plants three in a five-inch pot, without planting out; these may have a final shift in the end of August, and will by these means be of a dwarfer habit than the others, and will be found very useful. Early protection, and constantly clear liquid-manure, with abundance of light and air, are all the requisites henceforth, and, with the exception of sticks, they should have one to every main shoot, disposed in a graceful way. These are particularly fond of clear liquid-manure, and should have it abundantly the moment they show the flower-bud. They should constantly have all root-suckers pulled from them, and the shoots thinned judiciously, until the end of August. As a rule three principal shoots may be left to a six inch pot, four to an eight-inch, and five to a nine-inch pot, and so onwards. The plants should have abundance of light and room in an airy situation, after the month of July, and should be under cover in some light

and airy structure by the last week in September. They should have copious syringings every evening, when indoors, with abundance of air, day and night, until the blossoms open, when not only syringing must be discontinued, but all condensation of moisture on the leaf or flower be cautiously avoided. To this end all waterings must be performed in the morning, and a slight fire through the day, with a free circulation of air, to carry away all humidity of atmosphere by the closing time in the evening, after which period the fire must be only such as will just keep away frost; and it is well to allow a little egress of air at the back of the house for the escape of atmospheric moisture all night. A good roof covering, in lieu of a fire, would, no doubt, be excellent, and tend to prevent condensed steam on the blossoms. As compost, I have found the following everything that can be desired, viz., one half-rotten turf of strong and fat loam, and the other half composed of equal parts half mould and good rotten manure, to which add a good sprinkling of rough charcoal dust, and another of sharp and lively sand, and a handful or two of fine bone waste.

EMBELLISHMENTS OF THE GARDEN.



O embellish a garden well, needs a discriminating and in some cases a severe taste. Whatever errors may be committed in the laying out, the planting, and the disposition of colours, will more readily escape the eye or meet with forgiveness from the critic, than the injudicious adoption of any kind of special embellishment. Yet if the leading principles of gardening tastes are kept in view, the smallest plot may be so ornamented as to convey an impression of luxurious completeness, and present at all seasons a wealthy fulness that shall prove its owner to be an artist in the work; and the garden of ample dimensions and varied features, will have its several beauties enhanced and brought out by exactly similar means. We do not value a picture for the extent of its canvas, but for the perfect development of its story through the medium of form and colour, light and shade; and though artifices for concealing the dimensions of a piece of ground are, in most cases, illegitimate and unworthy, the more that ground, whether large or small, is embellished with special ornaments adapted to it and tastefully disposed, the more will its extent be really enlarged, because it will offer more and more to interest the eye, and occasion pleasurable emotions in the mind.

In this as in other things, ornament may be carried to excess; yet in the higher and architectural departments excess is not so much to be feared, when we remember how lavishly the gardens of ancient times were adorned with colonades, terraces, statues, fountains, and other productions of the quarry and the chisel; and how that same fulness of expression was sustained in the princely gardens which were the models of Italian art in landscape, and which remain to us on canvas and in books as examples

of taste worthy of being copied at the present time. Excess in this department is the less dangerous, because architectural forms of all kinds suggest wealth and ease; and it is one of the tendencies of wealth to multiply these sources of pleasure, and with an unsparing hand heap up on all sides the evidences of an enthusiasm in the refining arts. Indeed, when we meet with examples of excessive embellishment, it is usually of the strictly rustic class, which may certainly be most easily overdone; and an excess of rustic work anywhere betrays more of eccentricity and littleness than of a cultivated mind.

The first and fatal objection to elaborate ornamentation in gardens arises out of the fashion in which the houses themselves are built; for the garden begins at the garden door, the house is an integral portion of the whole scene, and except the princely mansions that melt by degrees into lawns and shrubberies, through the medium of terraces and gay parterres, the spectacle out of doors is ruined by the fact that *there* we have but a "back view of the premises."

Whatever builders may say about usage, and expense, and doing as their fathers did before them, it must be admitted that a fundamental principle of taste is violated when we give our houses handsome frontages to the public, and reserve for our own daily contemplation from the garden nothing but bare walls and plain windows, and oblique chimneys rising from a basement of ugliness. Why should the stranger see a fair exterior, and we ourselves in our privacy and home life, have to stare perpetually at outhouses, pantries, shapeless lobbies, and kitchen windows? Turn the house round then, and expose our domestic offices with the odour of our daily dinner to the streets? No;—let the rear wall and attached offices have as much symmetry as the portico, and flight of steps, and handsome windows in the front. It is as bad as for a man to appear in society with a showy vest and faultless collar, but with soiled fustian at his back, because, forsooth, you are not expected to address him from behind, or because "a front view of the elephant" is all that is seemly.

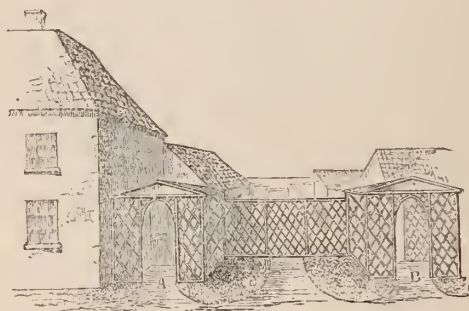
SCREENS.—Where architectural beauty is fully developed, as it



is in many of the mansions of our nobility and landed gentry, the construction of terraces and geometric gardens may be definitely

proceeded with, but the hump-backed town houses admit of artistic embellishments very unkindly indeed. What is to be done for them? Sometimes the builder, for an additional outlay, will construct a balcony terrace, opening from the drawing-room window by a glass door, and leading down to the lawn by a flight of iron or stone steps. When you can have a handsome iron trellis of ornamental design, over which to carry a vine or a small collection of miscellaneous climbers, and with a few improvements above and below, taste and ease may be satisfactorily gratified, and the house fitted for the acceptance of what may be termed terrace ornaments. If the situation and character of the house does not admit of the builder's aid, refuge may be found in trellis-work, which certainly has a transforming power as effectual as Harlequin's wand, and in a manner at once simple and inexpensive.

An example of this mode of using trellis-work, is seen in the annexed sketches. The first presents us with a cluster of ugly buildings:—A is the larder, adjoining the kitchen, B a scullery, C a dog-house, D a back wall with door leading to a lane, E a stable, and F an open space littered with straw, and the results of frequent traffic between the several offices.

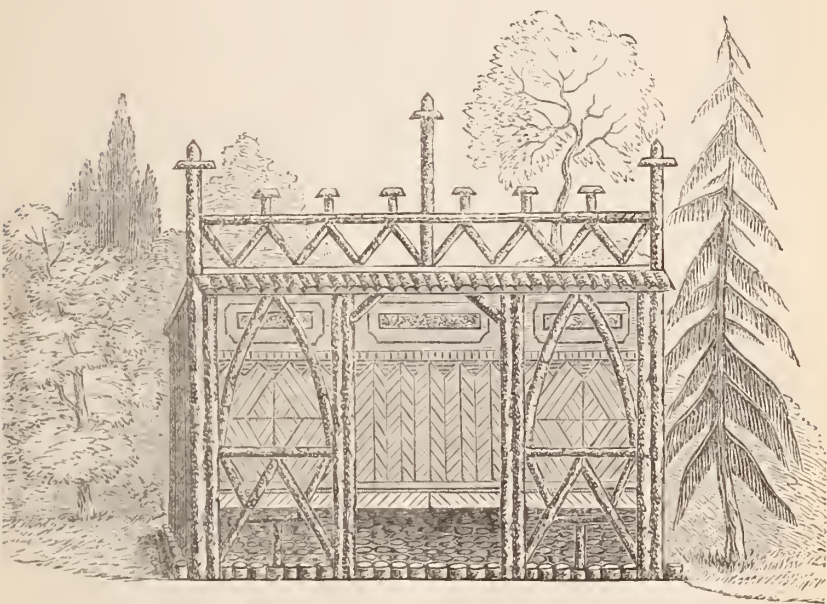


To change the scene, there is no need to alter the buildings, for the simplest lattice-work will effectually screen them from view without robbing them of light and air, and the lattice becomes additionally useful by covering it with climbing and twining plants.

In many cases a plain neatness is to be preferred to verdurous luxuriance, yet the occasions will be few indeed where walls and trellises will not need to be covered. A neat little country box embowered in jasmine, honeysuckle, pyrus, and ivy, conveys an idea of warmth, hospitality, and homely comfort; and where a dwelling-house has not a decidedly architectural aspect, it is all the better as to beauty and the dryness of its walls, to be well ivied and screened with greenness. Garden walls, outhouses, porticos, trellises, and arbours, all need the touch of floral grace to make them complete; and a judicious selection of such is another legitimate mode of extending your growing space and your round of pleasures.

For the fronts of houses, those two commonest of screens, ivy

and creeper-vine, are, for general purposes, the best that can be had. They train themselves. They may be cut trim, square, and sharp, or left to festoon the gables and chimneys at their own free will, and in any way are beautiful. The deep ruddy glare of the creeper in autumn is scarcely equalled by any tint of earth or sky—it is a sunset photographed. It is a matter of no small importance to adapt climbing plants to the positions they are to occupy. A few comparisons will illustrate the whole case. Search out, in spring, a great old wistaria in bloom upon a red-brick wall, and the contrast of the pale-blue flowers, the delicate glossy green leaves, and the russet ground-work, will be delightful. Now find another wistaria equally flowery, trained on a grey wall of stucco, or reddish stone, and the tameness of the picture will surprise one who has



never before paid attention to the subject. But if, on that same red-brick wall, and on the same stone or stuccoed wall, we find, six weeks afterwards, a bonny breadth of Boursault roses in bloom, the tables will be turned; on the dull red ground the roses are robbed of their beauty; on the bright grey wall they show their colour in perfection, and are as appropriate, so far as colour is concerned, as the most exacting critic could desire. It is another matter, and one of equal importance to that of tasteful adaptation, that climatal conditions should have due consideration. The lovely blue passion-flower may barely live on a cold soil in a north aspect, but the "ivy-green" will not despise such a home. Roses will scarcely thrive in any aspect on a hungry sand, but cotoneaster,

October.

clematis, or creeper-vine might thrive there. We cannot pursue the subject, but these brief hints may be useful.

The best screens in all cases are those which are at once useful and appropriate furniture, and have no appearance of being screens at all. A fine clump of mixed shrubs may effectually exclude from view an objectionable scene, without suggesting to any one that its office is to hide something much more than make a display on its own account. But a belt of common laurel on the same spot will have an unmitigable screen-like look, and to some quick minds, will prove as suggestive as if in its place there stood a great sign-board, bearing an inscription, "Please not to look this way." A rustic alcove may be made to form the termination of a view, with the warrant of usefulness to justify it. Such a little construction as the figure on page 313 represents, is also well adapted to the purpose, as it may be extended any reasonable distance right and left. A few shrubs rising above it in the rear will effectually complete it as a block to the view, without the shadow of a suggestion of anything ugly beyond requiring to be hidden.

A collector of antiquities might extemporize a screen delightfully *negligé* and artistic, all unintentionally, by thrusting into some odd nook in the garden ancient monuments and slabs of stone, for which there could not be found accommodation in the museum. Some such effect as this, a little less classic in tone perhaps, we may see in a country builder's yard, and possibly in such a place materials towards an imitation of our own sketch (mayhap an improvement on it might be obtained at a very trifling cost). In the event of an imitation being adopted, the materials should all be copies of authentic originals, both for the sake of effect and to enable the owner to relate their history when questioned by a curious guest.

GREEN ARCADES.—Overmuch pruning and trimming of trees results in harshness of outlines, and the inevitable deadness that accompanies tameness and sameness. It is well to see trees of distinctive habit towering up in all their natural character without guidance or compulsion, even in the midst of the most highly dressed and formal gardens. We are no advocates for wood-chopping in general, nevertheless there are good reasons for the practice in particular cases, and by judicious clipping and pruning beautiful effects may be produced both in the highly finished and the semi-rustic scenes.

The solemn shade,
Verdure and gloom, where many branches meet ;
So grateful, when the noon of summer made
The valleys sick with heat.

(To be continued.)

TREATMENT OF CINERARIAS.



COMMON as these plants are, yet few manage them well. We too often see tall drawn-up plants, instead of dwarf bushes. Propagation is easily effected by dividing the young offsets from the old plants, and potting into small sized pots; but cuttings are preferable, which should be put in about the end of June, and placed in a cold frame; or, select seed from the best varieties, sow early in the spring, in wide-mouthed pots or pans, and place them where they may receive a gentle bottom-heat; and when the seeds have germinated, and the rough leaves are making their appearance, move them carefully into small sized pots and continue them in a gentle heat, until the weather will permit them to be removed to a frame. Let their position be close to the glass—kept shaded and free from air for a few days; after which give a little air, gradually increasing it until they become comparatively hardened, so that, after a short period, air may be given without engendering any disorder in the plants. Water should be applied moderately, just enough to keep them moist. Never by any means allow them to become thoroughly dry, for the insufficiency of water is the sole cause of that destructive fungus called mildew, which gradually increases, until the plants get into an unhealthy state, and become next to useless. Then how important it is to be on the watch for this insidious foe; for prevention is better than cure, and it is much easier to expel the disease on its first approach than when it has been permitted to ruin the plant. Three things have come under my observation as regards excluding this encroaching fungus. First, by admitting a free circulation of air, which should be regularly attended to every day, shutting it off at night. Secondly, as before stated, by attending carefully to the watering. Thirdly, by removing the dead foliage from them, which is also a harbour for green-fly. By adopting the above treatment, I have successfully kept this destructive parasite in check. If green-fly appears, with which they are very apt to be infested, fumigate with tobacco. The plants should now require a shift into a larger sized pot, and let the following compost be used: turfy peat, fibry loam, leaf-mould, decomposed cow-dung, and drift-sand, equal parts of each, beaten roughly together, mixing in a little silver sand. Prepare a six-inch sized pot, with a good drainage, over which place a thin layer of turfy peat, to prevent the soil from intermixing with the sherds. Repot, and again place them in the frame. Water moderately, and the admittance of a good current of air will also have a good effect on them. Let all possible care be taken not to have the roots coiled and cramped by their coming in contact with the side of the pot, which is generally the case after subsisting in the same pot too long. Then, as soon as the roots are penetrating through the soil, let the plant be again repotted into a larger sized pot, using the aforesaid admixture, and be replaced in the same position as before described, keeping them thoroughly clear from aphides by occasionally fumigating. By this time they

will have made great progress, and become good sized plants, and those which will not be likely to be overgrown by such a stimulant may have occasional watering with liquid manure. Cow-dung is the best manure to use, as by it the flowers are made brighter in colour. About the end of October potting should be proceeded with, taking care to pot them into the same soil as that described. A change of soil at this period is highly prejudicial. Six or eight-inch pots should be devoted to the largest plants; and soil rougher than that formerly described. Place them in a greenhouse, close to the glass, thus they will be prevented from being drawn up too weakly. They may be also grown in a frame during the winter, if there is a flue or hot-water apparatus, to prevent the frost from injuring them. Between this and the time for flowering let all means be taken to insure a vigorous growth, carefully tying out, so that the plants may assume a neat and compact form. About the end of February they will have expanded their flowers; then the varieties of colour, long continuance in bloom, and the splendid show which will be formed by them, in the greenhouse or conservatory, at this period of the year when there is little else in bloom, will amply repay the grower for the care which has been bestowed upon them, and any person, by practising the above, may calculate on success. As soon as the bloom begins to decay, and the leaves are turning yellow, less water must be applied. Remove them into a frame, or, if not convenient, out of doors will suit them. As the plants are of an herbaceous habit, they require a period of rest. Some persons prefer growing them entirely in a pit, with a command of heat, which should only be used in case of frost, removing them to the conservatory, or greenhouse, when in bloom. Tie the side-shoots out, and give the plants plenty of room. This, with cleanliness, will make them grow in any soil.

NOTES ON TRANSPLANTING.

(Continued from page 274.)



OW, while the season in which trees and shrubs that have to be carried long distances may be transplanted with a fair prospect of success, or even such as occupy but a day or so in their transit, must of necessity be comparatively limited; where they have to be removed merely a few hundred yards at most, the circumstances are very different, and will allow transplanting to be carried on, at least in a limited degree, during the greater part of the year. It is often of much importance to do this. That it may be safely accomplished, the directions and examples to be presently given will show. In laying down rules for guidance in any operation, it becomes exceedingly difficult to particularise between the general and the special. In fact, it is almost impossible to do so; something must always be left for experience to ascertain. And it is in consequence of those who

seek guidance from such principles expecting too much from a mere rule of thumb application of them, that complete failure is so often experienced, or at least that the true value of such principles is so seldom ascertained. These observations are not only applicable to the theory of transplanting, but to every other operation of which the principles can (and it would be difficult to name one of which they could not) be conveyed in a written treatise.

Thus most persons who know anything about planting at all will have learnt that evergreens should be transplanted in autumn, or under certain conditions in spring; and that the deciduous trees and shrubs should be removed at some period between the falling of the leaf in autumn and the swelling of the bud in the following year. These may be considered as the broad principles, which, if duly and properly carried out in practice, all other circumstances being favourable, will be productive of much success. But as regards both evergreens and deciduous plants, these principles may be practically violated to a wide extent; with the former, however, much more than with the latter. It will be borne in mind that the observations and illustrations now to be given have sole reference to plants that can be replanted immediately after being taken up. At the end of June in the present year, I determined on moving two large plants of *Forsythia viridissima*, which were monopolizing too much space in a bed of small flowering shrubs in my own garden. In the places which I intended them to occupy, holes were dug and well watered. The plants being put in, and sufficient soil thrown upon the roots to cover them, another good watering was given, and the remaining soil filled in. The plants were growing luxuriantly at the time; nevertheless, they gave no indications of being injured. In fact, not a leaf drooped. Of course growth for the season was checked, but that was rather an advantage than otherwise, for it induced short sturdy shoots, which, in a *Forsythia*, constitute perfection. Obtain these, and you have flowers in abundance.

Now, the success of these plants depended in no small degree on the peculiar character of their roots. They have an abundance of succulent fibres, which, if the plant is at all carefully removed, are ready to resume their functions immediately after transplanting; and those of the plants in question being supplied with plenty of moisture, and kept out of the ground but a short time, no material check was given. In transplanting under similar conditions, this is an important point to attend to; and, in fact, under any circumstances whatever, it should be kept in view.

Of course there are many other deciduous shrubs than the *Forsythia*, which, if necessary, might be transplanted in summer with perfect safety. Plants with long woody roots having but few fibres, and those principally at the extremities, it would be hazardous to experiment upon; but such as have an abundance of succulent rootlets, principally within a foot or two of the base of the stem, may with proper care be as successfully transplanted in summer as at any other season. Recollect it is not recommended to transplant any shrub or tree in summer in preference to autumn; but where circumstances render it necessary or advantageous to do so, it may

with certain plants be ventured upon with perfect safety. Evergreens, as before hinted, afford much more scope for variation in the periods of removal than deciduous shrubs and trees. It would be difficult to name a month in the whole year when some of them may not be transplanted with success. Much will, however, of course depend upon the condition of the individual to be removed. If it has occupied its situation for a series of years, and has consequently become coarse rooted, it is hardly a fit subject to be transplanted in summer. In fact, such a plant would require very careful treatment if removed at the best of all seasons, autumn, and under the most favourable circumstances to give it a chance of success. Plants so circumstanced mostly require a special course of education to fit them for a change of place when advisable to transplant them at all. But such as are of a reasonable size and in a good moveable condition may be transplanted successfully at widely different periods of the year. Thus Conifers may be transplanted safely when the young shoots are three or four inches long, and in a succulent state, provided proper precautions are taken and plenty of water given at the time. I recollect an instance where some hundreds were moved in the middle of June, and a very hot June too, with hardly the loss of a plant. Nor were they in the best possible condition at root either for such an experiment. However, circumstances rendered it necessary that they should be moved, and moved they accordingly were. Each plant as it was taken up was dipped, as described in a former page, and also well wetted at root when planted. The young shoots drooped beneath the sun for a day or two; but in the course of a week the plants were established, and the general result was all that could be desired.

Again, in order to finish the planting of a new garden, it was necessary to carry on the work far into the spring. The last plants removed were some common laurels, five or six feet in height. The ground was loose and gravelly, and prevented anything like a ball of earth being secured with the roots; in fact, when each plant was taken up all the earth fell away, leaving the roots wholly bare. Great care was exercised to preserve, as far as possible, the succulent and active rootlets, which were in abundance, from injury. The plants were removed about the sixth of May, when the young shoots had pushed several inches in length; nevertheless, not one plant died, nor did any receive much damage. A few showery days succeeded their removal, and doubtless contributed much to their success. If it is urged that such natural conditions can rarely be calculated on, and that planting at that season is consequently not generally practicable, it must be admitted that the results of such experiments teach us under what various conditions planting may be carried on, and that in a limited practice at least these conditions may, to some extent, be given artificially.

The Evergreen Oak is perhaps one of the most difficult trees to transplant successfully, yet, if the proper conditions be secured it succeeds well enough. I once saw a number, a week or two after their removal, that had been transplanted in May, when their young shoots were an inch or two long. Hardly a plant had failed. I

learned that they had been well dipped at root and copiously watered when planted. In Guernsey, where the Evergreen Oak is much employed for shelter on the most exposed places, where, in fact, it is often covered with salt spray, they remove large specimens of it with perfect safety at midsummer. If the plant to be removed has a very large head in proportion to the roots, some of its branches are shortened back, but no other precautions are taken to ensure success. A failure is very rare indeed. The damp climate of the island of course contributes mainly to this success; for no newly-planted tree suffers more from the effects of evaporation from its leaves than the Evergreen Oak. When subjected to a dry atmosphere with a feeble root action, as a recently planted tree would naturally be in our climate, then speedy dissolution from dessication of the tissues would almost certainly follow. Now this evaporation from the leaves and succulent branches of newly-planted trees is the primary cause of their failure, and in proportion as it can be guarded against or compensated for, so will success be found.

Deciduous trees when moved, as they must generally be, when the leaf has fallen, are of course not subject to the draining of their juices by evaporation to a like extent—a condition which gives them in some respects an advantage over evergreens in sustaining the casualties of transplanting. Now nothing favours evaporation so much as a dry *moving* atmosphere; as, for instance, during bright windy days in March. From this circumstance that month is deemed, and rightly too, the worst in which to transplant evergreens throughout the year. No one who can possibly avoid it should attempt it then. It is easy to imagine that, from the constant passing away of the fluids of a plant with no means of replenishing them, the individual must soon cease to exist. And in March, too, vegetation is often inactive as at midwinter, which circumstance, coupled with its invariably dry atmosphere, is an additional reason for not planting then.

When a shrub or tree is transplanted it should be under conditions which will allow it to recommence growth immediately, to enable it, by absorbing at the roots, to counteract the loss of fluid at the leaves. To insure this the plant must be removed before it is completely at rest in the autumn, or after vegetation has commenced in spring. At either of these periods nature immediately sets about repairing any injury which the plant may have received. The roots which are destroyed, and many will inevitably be so, are then replaced by others, the work of nutrition goes on, and the natural functions of the plant are resumed. If you examine a shrub that has been transplanted while vegetation was active in autumn, even a few days after its removal, you will perceive the roots covered with myriads of white shining points; the new rootlets in fact hastening to re-establish the plant before winter sets in and renders the vegetative principle all but inert. Plants require both at root and branch a certain degree of warmth to enable them to fully perform their functions. In autumn the soil retains a considerable amount of heat, and is favourable to the formation of roots. In midwinter this is not apparent, even though the weather should be open, for

the soil has lost the greater part of its acquired warmth by radiation then, only to be again obtained from the returning sun in spring. Plants removed in spring are in conditions somewhat analogous to those transplanted in autumn. Vegetation not being dormant, their roots are immediately formed, and the plant is not materially checked. The great drawbacks to spring planting are the daily increasing power of the sun and the periods of dry weather which are frequently experienced at that season. Where plants are coarse rooted and have to be carried a long distance, spring planting becomes hazardous, and great care will be required in its execution if attempted then.

(To be continued.)

REMINDERS FOR GARDEN WORK IN OCTOBER.



URICULAS must now be considered in their winter abode, and be placed on their winter allowance. Plenty of air in mild weather, very little water, and no violent cutting winds.

CHRYSANTHEMUMS may be removed to the house for blooming, having stood out all the weather they will flower fine and dwarf.

PERENNIALS not parted last month may be divided now.

TULIPS.—Commence planting out beds and finish all offsets; prepare also the best bed, by putting three inches of cow-dung at the bottom, and returning all the soil to the bed.

BIENNIALS may be planted where they are to remain; but the borders should be loosened, and the clumps well forked to clean them, and to get them ready to receive anything that may be planted.

DAHLIAS have done their work for shows, and when their flowers are not wanted they may be lifted, so as to take no more nourishment from the ground, but must be covered with earth a few days, lest the frost should reach them.

FRUIT TREES and BUSHES.—Raspberry canes, etc., may be moved in general from the end of the present month to the period that they begin to swell their buds; so, also, may the pruning be commenced. In pruning gooseberries and currants, the side branches should be cut pretty close, to form spurs, and the main branches should not be sufficiently numerous to be in each other's way. These bushes do best in strong rich land, and it should be trenched eighteen inches deep before they are planted.

CABBAGES.—The August sown should be planted out for spring use twice as thickly as they are wanted, that when every other one is drawn for greens during the winter, the others may be left to form cabbages. The weakest may be left in the seed-bed, or be pricked out three inches apart, for future planting.

LETTUCES.—Plant out in warm situations.

CARROTS and PARSNIPS, full grown, may be taken up for storing.

CELERY, earth as usual.

HOING between crops, weeding, clearing paths, digging vacant spaces, and leaving them in ridges or rough dung, are self-evident duties; so also is the destruction of all kinds of vermin.



THE RANUNCULUS.



HERE is a marked difference between the old varieties of this flower and the seedlings which have been raised during the last few years. The tubers of the former are generally less robust and plump; the foliage is often weaker, and the flowers are almost always inferior in size and substance of petal to those of newly-raised seedlings. The act of hybridizing has been wonderfully successful with the *Ranunculus*, and some new beauties are annually produced. Unless the old kinds are very striking and unlike the modern varieties, the amateur is recommended to make his bed of new sorts. His success will be more certain, and the healthy and vigorous growth of the roots more satisfactory. A packet of carefully selected seed, purchased of a well-known cultivator, will repay all the attention bestowed in raising it; but this task should be undertaken by one who has had some general experience in the growth of the flower. Three seasons must pass before all the seedlings can be expected to exhibit their character, and even then the quality they will finally assume cannot always be ascertained. Some of the finest sorts will at first be semi-double, and time is consequently required to test their real excellence.

Raising from seed, therefore, is not the course to be pursued by those who are growing *ranunculuses* for the first time; and although I hope to be able to assist in this interesting pursuit on a future occasion, it will be more requisite now to point out the best mode of getting a collection of well-known and established flowers. Without wishing in the slightest degree to question the integrity of seedsmen and florists, I feel it necessary to caution amateurs on the subject of purchasing *ranunculuses*, as good kinds are expensive, and a failure is therefore very provoking. A very fine show may, indeed, be secured by one or two hundred mixed roots, which may be purchased at very small cost; and where a cheap bed is an object, or where the amateur fears to run a greater risk until he has acquired experience, mixtures may be recommended. But if you intend to raise a bed which shall excite the rivalry of your neighbours, and enable you to compete at a floricultural exhibition, you must be content to pay for flowers of a higher character, which are warranted true to name, and which may therefore be expected to repay you for your expense and care. Get them from the grower, if you can, for in changing hands, seeds and roots often change names, and discredit the seller and vex the buyer. There are some celebrated growers of *ranunculuses* who have devoted their energies especially to this root; and, without mentioning their names, I recommend you to apply to them. You may select from their catalogues, and may rely on their sending you sound tubers. Indeed, if you state the size of your bed, you may leave the selection to them, as they are acquainted with the varieties whose combination will produce the happiest results.

Another plan should be mentioned as suitable for those who

may not be able or willing to incur much expense. Get a dozen first-rate roots, and, placing them in different parts of the bed, fill up the spaces with common ones. If you are obliged yourself to select, you must bear in mind that roots may be true to name, and yet in themselves useless.

The great difficulty to be overcome in growing the ranunculus is encountered after the bloom is passed away, and the roots will be either good or bad the following year, as they are then treated. On this subject very much might be said. The criterion by which a healthy root is known, is the plumpness of the forked portions, and the fine velvety texture of the crown, especially the latter. The tuber itself may be small and shrivelled, and yet the crown will indicate a sound condition; while, on the other hand, a plumpness of the tuber is of no service if the crown is dull, and instead of becoming bright when rubbed by the hand on the coat, crumbles away.

Like the dahlia, the tuber of the ranunculus will be quite healthy in itself, even where all the young buds or eyes are destroyed. It may even live some time in the ground; but vain will be the expectation of seeing a green shoot. When the substance of the tuber is well filled, and the crown is glossy, success may be confidently expected, as far as the roots themselves are concerned. It should be remembered that the silkiness of the crown, although always present in some degree, increases as the growing season advances. The Turban ranunculus makes a very splendid show, and I wonder it is not more grown in large gardens, as beds of it, each filled with flowers of one colour, would have a most imposing effect. The various kinds of Turbans may be purchased for three or four shillings a hundred. As an early flower, it is worthy of notice. I have had yellow Turbans off bloom and ready to be removed by the second week in June, in time for filling the beds with other plants.

The ranunculus may be taken up without injury as soon as the flower is withered, if the mould be allowed to adhere to it, and all the roots thus removed are put into the ground in a place secured from rain. They will then gradually become fully matured, and may be cleared away in July. This latter circumstance removes the objection of the beds being occupied too long to allow their being afterwards filled with flowering plants. Half a dozen beds on a green plot would present a gorgeous sight in May and June.

POT CULTURE OF JAPAN LILIES.

BY A CONTRIBUTOR.



It is a matter of surprise and regret with me that I do not more frequently meet with these noble autumnal flowers in the collections of amateurs, for they are, in my estimation, the most beautiful of all our autumn-flowering plants; and they are so easily managed, and occupy so little house-room, that they are just suited for persons that can afford only a limited space for one kind of plant. I sometimes meet with people who entertain the idea that, because they are so truly beautiful, they must be difficult to manage, and, in consequence, they neglect their culture altogether. Now, I find them the least troublesome of all my favourites, and the most certain to reward me for the little attention they receive.

My method of cultivating them is simple and soon told; and I have no doubt that any amateur commencing their cultivation, by attending to the following directions, will be equally successful with myself. Let us begin with the bulbs in the condition in which they are usually found in the beginning of November, when they have done flowering. Some of mine have just gone out of flower; others are well ripened, and ready for repotting. But as their treatment after flowering is of great importance, we will suppose they have just dropped their blossoms. Remove them to a rather warm situation, and as dry as you can command, and give them little or no more water. I generally water lightly two or three times after my plants are placed in circumstances to ripen. A warm greenhouse or pit, kept rather close, if not moist, will effect this important desideratum perfectly.

As soon as the bulbs are sufficiently matured, which will be known by the decay of the leaves and stems, they had better be repotted; not that this is of importance at present, but it will economise space, and prevent the operation being neglected until after they have made fresh roots. The soil in which they have been growing ought to be entirely removed from the bulbs, and the latter divided as may be thought proper, for there will always be found about the crown of the parent some small bulbs, which may be placed in four-inch pots. If the ripening process has been complete, the roots will not be troublesome; but if not, there will be found a quantity of fresh roots remaining. When such is the case, I leave them to themselves for some time longer, for I never pot while I require to cut or break the stronger roots, but merely strip my fingers through them, in order to remove those that are decayed.

The pots should be just sufficiently large to receive the bulb and strong roots adhering to it. Give a moderate watering to settle the soil, and place them in the greenhouse or cool pit. They will require no further attention until the season begins to excite vegetation, when they must be regularly attended to. Water as soon as

November.

you see signs of growth, but sparingly until they have made leaves, etc., to draw up and give off moisture. March will generally be found to be the time when they will commence growth. As soon as they are above the soil, remove them to a situation where they will be near the glass and have plenty of air, for after success depends upon getting them strong at this stage. Do not allow them to remain in the small pots in which they were wintered until their roots become matted; the best way of managing this is occasionally to examine them. I always shift into flowering-pots just as the plants have protruded an abundance of fresh roots against the sides of the pots. For strong bulbs with one stem use twelve-inch pots, and for such as produce two stems a size larger. Weaker bulbs, such as produce about seven flowers, will not require pots above eight inches, and offsets of the first year will not require above five-inch pots.

In shifting into the flowering-pots, be careful to place the crown of the bulbs about three inches below the surface of the soil, as they produce a quantity of strong roots from the base of the stem. They ought, after potting, to occupy a place near the glass; and avoid a warm house if you wish a strong bloom. As regards watering, they must have a careful supply, neither too much nor too little; but if they can be sprinkled overhead with the syringe before shutting up the house, they will not require much water at the roots for some time. Towards the end of May, if the weather is favourable, they may be placed in a warm, sheltered spot out of doors, and ought to have their stems tied to a stake, in order to prevent their being injured by wind. A few plants may be retained in the greenhouse, with a view to have them in flower earlier. Indeed, I place some of my bulbs in a moderately close, warm house early in March, and I manage to have them in flower early in August; others I retard, to prolong their flowering until October; but a season's practice will be the best guide in this matter.

These lilies are not liable to suffer from the attacks of insects, but the green-fly will occasionally make its appearance upon such of the plants as may have been kept over warm. If so, fumigate at once with tobacco-smoke, or wash the leaves with weak tobacco-water.

I have said nothing about soil, for they are not very particular in this respect. I use fresh fibrous loam and peat in equal portions, with a sufficient quantity of sand to render it porous. If peat cannot be had, use leaf-soil. Some say, however, that the flowers are much higher coloured in peat.

The only thing requiring further notice is, to be careful of the flowers when you have got them, syringing overhead, or a damp, stagnant atmosphere will spoil them, just as it would a light-coloured camellia flower. I once lost a fine head of bloom in this way. If you are anxious to propagate them, it may be effected by means of the scales of the bulbs. Fill a pan similar to that recommended for growing them in; lay the scales upon the surface, and sprinkle a little fine soil over them; give a little water, and place the pan in a close, warm atmosphere. This is, however, a part of the business

which had better be left to professional hands, and except the amateur be proficient in such work, he will not be very successful. If properly managed, they will soon increase by natural means to more than can be accommodated.

I may just state, by way of conclusion, that, in my opinion, these fine lilies have one fault: they produce their flowers too far from the surface of the soil. I have tried to remedy this by placing three smaller bulbs in a pot with the principal one at the first potting, and I think this improves their appearance when in flower. With this exception, they are splendid productions, and deserve the most extensive cultivation; grown in masses in large pots, or in conservatory borders, they are surpassingly grand, and they are quite within the means of the amateur. Do not be satisfied with your treatment unless your full-grown bulbs produce from twenty-five to thirty flowers upon a single stem.

GOMPHOLOBIUMS.



THESE beautiful plants are generally looked upon by beginners as being very difficult to cultivate successfully, and therefore they are comparatively rare in collections. If the following mode of treatment is pursued, however, there need be little fear of failure. In selecting young plants from the nursery, choose those that are strong and healthy, and in proper condition as to pot room. If received at the present season, they should be wintered in the warmest part of the greenhouse, keeping them as near the glass as convenient, and let them be carefully supplied with water at the root. When the object is to obtain the largest possible amount of growth in the course of one season, they may with propriety be placed in a moist growing temperature of from 45° to 50° at night, allowing it to rise 10° by day with air and sunshine, early in March, or as early after that season as circumstances may permit. Any straggling shoot should be cut back, so as to secure a compact, close habit of growth, and the supply of water will probably need to be increased after placing the plant in a warmer situation, but give no more than may be absolutely required to keep the soil in a healthy state; and if the syringe is used morning and evening during bright weather, and a moist atmosphere maintained, very little water at the root will suffice. Healthy young plants will soon start into active growth when placed in a moist growing temperature, and when this is observed to be the case, examine the state of the roots, and give a moderate shift if the roots are abundant and active, but never shift a plant unless the ball is well filled with healthy, active roots. Be careful to have the soil to be used in repotting in a nice moist, healthy state, and in proper condition as regards age, taking care that the ball is also neither too wet nor too dry; keep rather close and moist, and sprinkle the plants over-head morning and evening, and apply water to the soil with the greatest care for a time after

repotting, until the roots have struck into the fresh soil. Although most of the varieties will bear a moderate degree of warmth if accompanied with a corresponding amount of moisture in the atmosphere, the temperature should not be kept much higher by artificial means at any period of the season than that recommended as proper for starting the plants into growth, and air should be freely admitted on every favourable occasion, taking care to avoid cold, drying currents.

About the end of May or beginning of June, the young specimens may be removed to a close pit or frame, which will form a very suitable situation for their summer's growth, and where their little wants may be conveniently supplied. If inconvenient, however, to afford them a situation in a close pit, the warm end of the greenhouse will answer, with attention, to maintain a moist atmosphere, and to keep the plants near the glass. Healthy, thriving specimens will probably require a second shift early in June, and this should be given immediately it is required, in order to get the pots well filled with roots previous to winter. The same care must be observed as to soil, etc., in potting, as recommended for the last shift, and the size of the shift should be regulated by the vigour of the specimen, observing that it is much safer to allow the plants to get slightly pot-bound previous to winter than to have them over-potted at that season. During the summer months they will make rapid progress if in good health and properly attended to. Maintain a moist atmosphere, and sprinkle them over-head on the mornings and evenings of bright days, giving a free circulation of air, except during drying winds, when the lights should be raised on the sheltered side only, and a thin shade thrown over the glass to keep the temperature down; and unless the pit or house in which the plants are occupies a position slightly sheltered from the forenoon's sun, a thin shade for a few hours on the forenoons of bright days will be beneficial. As to stopping beyond what may be necessary early in the season to secure a close, bushy foundation, nothing further in this way will be needed, to keep the shoots properly tied in. Towards the middle of September, gradually decrease the amount of moisture in the atmosphere, and give air more freely, in order to check the growth and ripen the wood preparatory to winter; and as soon as damp, cloudy weather occurs, remove the specimens to the warm end of the greenhouse, and treat them during winter as recommended above. Plants intended for blooming may be allowed to remain in the greenhouse to expand their blossoms; but where large specimens are desired, it will be necessary to grow them another season without allowing them to blossom; and in this case the second season's treatment may be in every respect similar to the first. While in blossom the specimens may be removed to the flower-house or elsewhere, provided they are not subjected to sudden changes of temperature or exposed to cold, drying currents. Blooming specimens, when their beauty is over for the season, should have their branches slightly cut back, thinning out weakly pieces, and be placed in a moist, growing temperature, to induce them to start into growth, and should then have

their roots examined, giving a small shift, taking care to clear away all sour and bad soil. When the plants have made a moderate growth, sufficient to afford a good display of blossom, they may be removed to a cooler and drier situation, but it is unsafe to trust *Gompholobiums* out of doors; and they are so prolific of blossom when kept in growing condition that they will repay the protection of glass. For soil, take good turfy peat, broken up into pieces about the size of garden beans, rejecting all but the prime fibry portions, and add about one-fourth of sharp silver-sand, and a liberal allowance of potsherds, broken small; well mix them together, and be careful to have it in a nice moist, healthy state, when wanted for use. No care in providing for the escape of water through the soil will be sufficient to effect the purpose unless the same object is kept in view in crocking the pots, and also in the operations of shifting; and unless thoroughly efficient drainage is secured, success need hardly be expected. Beginners will also do well not to apply water carelessly whenever the surface of the soil appears dry, without ascertaining whether the mass is in that condition, and also to avoid giving small drops frequently. Give a thorough watering when necessary, and no more until it is really wanted again.

GEISSOMERIA LONGIFLORA.



THE spikes of bright scarlet flowers which terminate every shoot of a well-managed specimen of this *Acanthad*, and which have the advantage of being produced during the dull months of winter, make it a plant of no ordinary value. Its only fault is its straggling habit; but by placing several small plants in a large pot, and keeping the shoots regularly stopped and tied out, this difficulty is easily overcome. Cuttings made of moderately firm portions of the current season's wood root freely if planted in well-drained pots, filled with light sandy soil, covered with a glass, and placed in a gentle bottom-heat. They should be got in sufficiently early in the season to allow of their getting well-established in 7-inch pots in the course of the summer, which, with ordinary accommodation may be effected after April. When sufficiently rooted, pot them two in 5-inch pots, and afford them a close, rather warm, moist situation, until they get well established, when they may be stopped, and allowed a freer circulation of air; shift into 7-inch pots as soon as the roots require more space, and keep the plants growing slowly during the summer months, keeping them close to the glass, and regularly stopped, so as to induce a bushy habit; they should be sparingly supplied with water during winter, and they may be placed in the warm end of a greenhouse, where, if not over watered, they will be quite safe. When the wood appears well ripened, cut back the shoots, leaving about two pair of eyes on each, and keep the soil very dry until the time for starting the plants into growth. In order to obtain very large specimens, the plants should be placed in growing circum-

stances not later than the beginning of March; and as soon as growth commences shake the soil from the roots, and shift into pots just sufficiently large to admit the roots; a temperature of about 60° at night, allowing it to rise some 10° with sunshine and air, will be suitable; and they should be kept near the glass, and air admitted on favourable occasions, in order to induce stocky growth. Water the soil cautiously until the roots become active, but moisten the plants overhead, morning and evening, with the syringe, to keep the foliage clean, etc. This plant is very subject to the attacks of aphides, and therefore these pests should never be allowed to establish themselves; they should be destroyed at once, either by means of tobacco-smoke or by syringing with tobacco-water, and this should be repeated as often as may be necessary during the growing season, taking care to have the foliage clean when the plants commence flowering, as tobacco-smoke applied there would be apt to cause the blossoms to fall prematurely. As soon as the pots get moderately well filled with roots, shift into others, and now is the proper time to place several plants in a large pot to form the foundation of large handsome bushes. About five plants placed in a 10-inch pot will be found to make large specimens with comparatively little trouble, whereas to form a good-sized specimen out of a single plant requires a long season's growth and very frequent stopping. During the warm summer months, they may be placed in a close pit or frame, where they will succeed very well without artificial heat. Keep them near the glass, and stop the shoots frequently, keeping them well-tied out to secure strong dwarf growth, and shift into pots a size larger than before, as the roots may require space. Towards the middle of September they should be returned to a house or pit where they can receive a little artificial heat to ripen their wood, and induce a plentiful display of bloom, and this will be promoted by keeping them rather short of water for a fortnight or so. It is also necessary to have respect to the season at which the plants are wished to bloom, and to stop accordingly, and it is hardly safe to practise stopping later in the season than the beginning or middle of August. When in flower the temperature should range at 45° at night, but it may be allowed to rise a few degrees with sun heat, and the atmosphere should be kept dry, otherwise the flowers are apt to decay sooner than they should do. After the beauty of the plants is over, they may be kept rather dry at the root, and placed in a cool situation, in order to afford them a season of rest, after which they should be cut back, shaken out of the soil, repotted, and treated as recommended for last season. Fresh plants, however, will be found to make handsomer specimens than those that have been frequently cut back, therefore all who have young stock may throw away the old plants as soon as they have done blooming. The most suitable soil for this plant is good, strong, rich, turfy loam, to which may be added a portion of well-decayed cow-dung, say one-sixth of the whole, about a like quantity of fibry peat or leaf soil, and a sufficient admixture of sharp clean sand to ensure a free percolation of water through the mass. In the case of large plants, which may be rather stinted for pot room, manure water may be given two or three times a week with advantage.

THE EGG PLANT.



THE fruits of the Egg Plant cultivated in the market gardens at Paris are round, oval, or oblong, according to the variety, and of a dull violet colour. In the climate of Paris the seeds must be sown about the end of December, or beginning of January. A hot-bed is prepared, the heat of which should be from 68° to 77° ; it is surrounded with a good lining, and covered with a layer of vegetable mould about five inches in thickness, and when the requisite degree of heat is attained the seeds are sown. The sashes are covered at night with a good straw mat. A fortnight or three weeks after sowing, a second bed, not so hot as the first, is prepared. This is covered with vegetable mould, and when their cotyledons are well developed, the young plants are pricked out into this second bed, and after some time they are again taken up and replanted in the same bed, but at the distance of eight or nine inches from each other. The covering up of the sashes at night is still continued, and as soon as the young plants begin to grow, a little air is given if the state of the temperature will permit. In the course of the month of March, another hot-bed is prepared. The frames are placed and the bed covered with vegetable mould. When the bed is of the proper heat, from 60° to 68° , four Egg Plants are planted under each four and a half feet sash. They do not get air for several days, in order that the plants may more readily take fresh root, after which a little air is given, by pushing the sashes either up or down, and these are opened wider as the season advances, so that they may be taken off in the month of May. The further attention they require consists in watering when necessary, and in clearing the leaves, which are often attacked by the red spider; next, all the young shoots which spring from the base of the stem are taken off, in order to obtain any main stem, which is pinched when it is sufficiently strong, with the view of forming two main branches, which are themselves pinched at a later period, in order to induce the development of laterals on them; and when the fruit is set, all the young shoots are taken off, in order to increase the size of the fruit. By these means fruit fit for gathering may be obtained about the end of June or beginning of July, and the plants bear in succession till October.

COLEONEMA PULCHRUM.



THE fine, graceful habit of growth, and profusion of bright-coloured, star-shaped blossoms, for which this plant is remarkable, render it well worth a place, even in limited collections; and as it is also of easier cultivation than most of our first-class greenhouse plants, it is therefore very suitable for growers who have had no great amount of experience in plant culture. The ordinary method of increasing hard-wooded greenhouse plants, will succeed perfectly in the case of

this one, but, as I have frequently observed, there is nothing gained by private growers propagating such plants for themselves. Indeed, the successful propagation of most greenhouse hard-wooded plants requires an amount of skill and experience such as beginners seldom possess; and so much time and careful attention are required to produce proper "young stuff," that where only a plant occasionally is wanted, it is cheaper to buy it than to grow it. Persons intending to commence the culture of this *Coleonema* should be in the possession of good, healthy, robust, bushy plants previous to March, which is the proper season for starting into growth such as are intended to form large specimens.

As early in the month as is convenient examine the state of the roots; if they are active and require more space, give a moderate shift, using good fibry peat, broken carefully up into small pieces about the size of peas, divesting it of all inert soil and fine particles, and mixing with it about one-third in bulk of good sharp silver sand, small clean potsherds or charcoal, incorporating the whole well together. The soil should have been stored in a warm dry place ready for use, and should be in a proper state as regards moisture, and care should be taken to have the ball of the plant in a kindly moist state when the operation of potting is performed. A situation near the glass, a temperature of about 45° at night, allowing it to rise some 10° with sun-heat and air, and a nice moist atmosphere, will be suitable after potting. All newly-potted plants are liable to suffer more from the careless application of water than at any other stage of their growth, therefore beginners cannot be too careful to avoid over-watering on the one hand, and giving too little on the other. The safest way of avoiding these evils is to sprinkle the plants over-head and keep the atmosphere rather close and moist until the roots lay hold of the fresh soil. When the plants start into vigorous growth, air must be admitted freely on every favourable occasion, in order to induce compact wood, and the shoots should be pinched back as may be necessary with a view to obtain compact specimens. With the increase of light and sunshine which the lengthening days of April will afford, the temperature may be allowed to range a few degrees higher, but the night heat should not be kept at more than 45° without a circulation of air, and too much air can hardly be given during mild days, and the atmosphere should be kept moist by syringing the plants over-head morning and evening, and sprinkling the floors, etc., of the house or pit. As soon as all danger from spring frosts and cold cutting winds is over, remove the specimens to a cold frame, and guard them against the ill effects of sudden changes of temperature, which may occur at this season. If in good health the plants will make rapid progress, and will require a second shift early in the summer, and such as are growing rapidly, if shifted early in June, may be allowed a liberal shift, say into pots two sizes larger than those they are in; but unless they are ready for repotting in June it will not be advisable to give more than a small shift, so as to have the pots well filled with roots previous to winter. The same soil as recommended for the last shift will be suitable for this, except that the peat should not be broken up so small, and similar

care in watering will be necessary until the plants get established in their new pots. A slight shade for a few hours in the forenoons of bright days will be beneficial, but this must not be overdone, and a free circulation of air should be maintained night and day, except when cold drying currents of wind may prevail, and then the lights should be raised on the sheltered side only, and the temperature kept down by means of shading. The plants will be greatly benefited by full exposure to the night dews when the weather is fine, but the lights should be so placed as to ward off a heavy storm of rain, should such occur; the lights should, however, be put on every morning, for the purpose of securing a moist atmosphere, and the plants should be moistened overhead, as well as the floor on which they stand. Inure the specimens to full exposure to air and sunshine by the beginning of September, in order to get the wood well ripened before the damp foggy days of November; and when cold damp weather occurs remove them to a light airy part of the greenhouse, which will be a proper place for them in winter, when water must be carefully administered. The same treatment continued during another season will furnish large handsome specimens, and as soon as the plants are large enough to be considered useful, they may be allowed to remain in a cool airy part of the greenhouse to expand their blossoms, after which they may be taken to the show-house, or any cool place where their beauty will be most enjoyable. When the beauty of the flower is over, the shoots should be cut back as much as may be necessary to keep the specimens close and bushy; and when growth recommences, give a moderate shift, and allow the plants a fortnight under glass, until the roots can lay hold of the fresh soil, then remove them to a warm sheltered part of the plant ground where they will make sufficient young wood for bloom in the course of the summer.

THE HYACINTH.



HERE are few plants in cultivation which so generously repay the attention given them as the hyacinth, or which are so accommodating in their habits. Hyacinths thrive in almost any soil, and planted in moist sand or placed on the surface of water, bloom almost as finely as when planted in the richest compost, and there is not a habitation fit for being the abode of man where they will not deign to grow and bloom. It is, therefore, no matter for surprise that the hyacinth has, from time immemorial, been a favourite with lovers of flowers in all grades of society. Its accommodating habit and easy culture bring its beautiful spikes of sweet-scented blossoms within the reach of the inhabitants of a cottage, or the possessor of the smallest garden plot; and in beauty and fragrance it is not surpassed by the most expensive plants, with which the opulent can decorate their flower-houses at Christmas. Much has been written respecting the culture of this lovely plant, the greater portion of which has, un-

fortunately, been calculated to deter persons dependent upon such sources of information from attempting its growth. It is usual with writers on the culture of the hyacinth to state that, to grow it successfully, a very rich soil is absolutely necessary. The following are the directions for the selection of a proper soil, from a treatise recently published, viz. : "A quarter turfy loam, a quarter decayed cow-dung, a quarter sharp or clean river-sand, and a quarter leaf-soil, with which a bed of the necessary size and two feet deep must be formed by those who would grow hyacinths properly." The removal of the natural soil, and procuring and replacing it with the above material, in any case would be a work of considerable expense, and altogether beyond the means of many lovers of early flowers. But we know, from experience, that any well-drained garden soil is easily rendered suitable for the growth of the hyacinth. If the soil is of a strong adhesive nature, add two inches of sharp sand, and as much good well-decayed manure; then dig the soil two feet deep, taking care to nicely mix the sand and manure with the soil as the work proceeds. Friable loamy soils will require merely a liberal dressing of manure, and deep digging; and it will be found that the hyacinth will produce equally fine spikes of blossom grown in soil prepared thus, as when planted in more expensive composts. The fact is, that the secret of having first-rate spikes of flowers consists more in the selection of properly-ripened bulbs than in the soil in which they may be grown; for, as in the case of other bulbous plants, there is stored in the hyacinth the embryo of the blossom and a large amount of accumulated matter, and the production of splendid spikes of flowers is vastly more dependent upon the presence of these in perfection in the bulbs, than upon their being planted in expensive composts. The best criterion which can be offered for the assistance of purchasers in the selection of proper bulbs is, that they should be proportionably heavy for their size, firm, and plump, particularly about the crown. Size is of hardly any importance, as some varieties produce small bulbs and others larger, and the varieties with the small bulbs produce equally fine spikes of flower as those with the largest bulbs.

The proper season for planting hyacinths in beds in the open air is the last fortnight of October and the first of November. Select a dry day for putting in the bulbs, and if the same can be chosen for the preparation of the soil, it will be in much better condition for the growth of the plant than if worked when wet. Plant in lines, nine inches by twelve inches apart, which will afford space between the plants when up to work a hoe for the destruction of weeds, and keeping the surface friable, to prevent the escape of moisture in dry weather. The crowns of the bulbs should be three inches under the surface of the soil; and lest a severe winter should occur, it is well to cover the bed with a few inches of old tan, or any light substance, to exclude frost. This should be removed, however, when the plants begin to grow through it.

The hyacinth is also remarkably well adapted for pot culture, and with the assistance of a garden frame, with some stable manure or tan to furnish a gentle heat, it may be had in flower at Christmas,

and, with a good stock of bulbs, the display may be kept up till April or May. For early flowering, the bulbs should be planted early in September; those in flower in spring need not be planted earlier than recommended for beds. The best pots are those known as "six-inch hyacinth pots," which, being deeper than common, afford more space for the roots. But where these cannot be conveniently procured, use six or seven-inch pots, such as may be at hand, and these will answer perfectly.

The soil used for potting should be as rich as possible, such as one half fresh loam, cut from a pasture, with the turf decayed in it, and well-decomposed cow or horse manure, with a small portion of clean sand. Fill the pots lightly with the prepared soil, and place the bulb upon the surface, slightly pressing it into the soil.

Set the pots on a dry surface, and cover with about three inches of old tan. After remaining here for a month or five weeks, the bulbs will be sufficiently rooted to render it safe to remove them to a gentle bottom-heat of about 55° , and introducing a few pots at intervals of about a fortnight, a succession of flowers will be secured until those in the open air come into bloom. Persons possessing no better accommodation for growing plants than a room window will, with careful management, be able to grow and flower the hyacinth well, if not to have it in bloom as early as those who can command a gentle heat. We need hardly observe that plants grown during the dark days of winter should be placed near the glass, and be freely supplied with air when this can be given with safety; and those grown in windows will draw to the light unless the pots are frequently turned. Most persons know that a sitting-room window forms a suitable situation for hyacinths while in bloom, and that their beauty will be no longer fading here than in most situations; but many remove them from a close atmosphere, and suddenly expose them to cold drying currents in the sitting-room window, by which they are greatly injured. We warn the inexperienced to guard against this common error, and to avoid subjecting the plants to sudden changes at any period of their growth.

DIPLADENIA CRASSINODA.



EW plants of a twining character are so suitable for pot culture as this charming *Dipladenia*. It does not grow too strongly, and under proper management it produces a profusion of large convolvulus-like blossoms, which remain long in perfection. For the decoration of a conservatory or a flower-house during summer and early autumn, I know of no more useful plant; for if carefully removed to a cool temperature as soon as the blossoms expand, they will become higher coloured, and remain longer in beauty than in a stove. Cuttings made of short-jointed, half-ripe shoots, will root freely if planted in sandy, peaty soil, covered with a bell-glass,

afforded a gentle bottom-heat, and carefully tended with water. Propagation should be proceeded with as early in the season as circumstances will admit, in order that the plants may be well established before autumn. To effect this, however, the cuttings should be potted as soon as they have become sufficiently rooted to bear handling. After potting, let them be placed near the glass, in a gentle bottom-heat, with a moist, warm, atmosphere. Shade them from the mid-day sun, and keep them growing briskly till late in autumn. On the approach of winter, gradually inure them to a cooler and drier atmosphere, in order to ripen the wood. While at rest afford them a light, airy situation, where the temperature may range from 50° to 60°, and give very little water to the soil. The plants should now be strong and healthy, and in seven-inch pots; and if this is not the case, as possibly it may not be, they should be grown on another season in the nursery pit, for it is useless to think of producing a large handsome-flowering specimen without a good, strong, healthy plant to commence with. As early in spring as a spare corner in a pit or house, with a gentle bottom-heat, and a moist, warm atmosphere, is at command, where the plants can be kept near the glass, turn them out of their pots, repair the drainage, and clear away all unkind soil, repotting in the same pots, and plunging in a bottom heat of about 80° or 85°. Any sickly points that may happen to be on the shoots, should be cut back to a plump bud, and weakly ones removed altogether, which will throw the sap into the stronger shoots, and those should be kept regularly tied, so as to expose the foliage to light, and induce the buds to break regularly. When growth commences, regulate the shoots so as to induce the buds to break regularly all over the plant, and as soon as active root action has been induced, shift into the blooming pots. Apply the trellis at once, and keep the shoots regularly tied in as they advance in growth, bending the points of any gross one downwards, which will equalize the growth, and keep them sufficiently thin to admit light and air. Plants, the pots of which are plunged in any warm, moist material, require much less water than if the pots are exposed to a warm dry atmosphere; and as this *Dipladenia* is very apt to suffer from excess of moisture at the root, water must be applied with care, especially in the case of recently-potted specimens. To give a liberal watering every time the surface soil may appear dry would probably destroy the specimen so treated, and therefore means must be used to ascertain that the ball is really dry before applying water, and when this is the case give a liberal soaking.

When the trellis, or frame, is well covered with strong, healthy wood, which, if all goes on well, should be the case early in summer, unless the plants exhibit a tendency to produce flowers, remove them from bottom-heat to a rather dry atmosphere, for about a fortnight, and give but very little water at the root, which will check growth, and produce a tendency to bloom, and return them to a warm, moist place, where they will soon be covered with blossom buds. I have already stated that the plant may be removed to a cool conservatory, or greenhouse, when had in bloom in summer;

but in removing it from a moist, warm, close situation, to a cool, dry, airy one. Some management will be necessary to prevent the leaves getting discoloured, or the plant sustaining a check. After blooming, place the plants in a house where the temperature may range rather high, to ripen up the wood, before placing them in their winter quarters; or in the case of plants that flower early, they may be allowed a short season of rest, then repotted, pruned back, etc., and be placed in bottom-heat and induced to make growth before winter; plants so treated must not be placed in low temperature during the winter, as this would discolour the foliage, and probably injure the roots and wood, but should be wintered in a light house, where the temperature may range from 55° to 60° , and be very carefully watered; specimens managed in this way will be ready to burst into bloom at any time in spring; they may be placed in a warm, moist temperature. *Dipladenia* is not a favourite with insects, and with a properly moist atmosphere it will hardly suffer from any pest except black thrips, which may probably attack it, and if so, should be eradicated by frequent doses of tobacco-smoke. The best soil for this lovely plant is good, rich, turfy peat, and light sandy turfy loam, in the proportion of about two-thirds of the former to one-third of the latter. To this add a very liberal allowance of clean, sharp sand, say one-fourth of the whole, and a quantity of clean potsherds broken small, and well mix the whole together. The soil should be ready mixed, and before using it placed where it will acquire about the same temperature as that of the ball of the plant to be shifted, and it should be in a proper state as regards moisture.

PRESERVATION OF DAHLIA ROOTS.

BY AN AMATEUR.



ROOTS should be taken up if not done already, and stored away until the time for starting them arrives. Flowers, however valuable, are apt to be neglected when their beauty is over, and cold, dreary, autumnal days induce the amateur gardener to remain indoors; this is particularly the case with Dahlias, which are allowed to remain very late before any care is bestowed upon them. They thus become the victims of hoar frosts, which injure the crowns, and prevent them shooting in the spring. In October the crowns should be protected, either by hoeing the soil round the stems or placing litter about them. Before the flowers are all faded, the names should be examined, for sometimes damp obliterates them, or the tally may be lost. It is vexatious to find, on taking up a root, that no name is attached to it; obliging you either to throw it away, or run the risk of carefully tending a variety not worth growing or having more of one sort than you wish to grow next year. An inspection of the

plants before their beauty is all fled will prevent this, for if the name is gone you will be able to keep a description of the flower. The proper mode of preserving the tubers during the winter does not seem to be generally understood, since amateurs are continually complaining that their stock is partly or wholly lost at the time for propagating.

Where there is a greenhouse, the roots are generally safe under the stage, placed in a heap, and covered with a mat or some straw. They have also been kept in a sound state in the stable, or any out-building secured from frost. Others have found that when left in the ground, and properly covered up, Dahlias are generally in a healthy state in the spring. Last year I potted mine, like potatoes, and found them in good order, except that some slugs had got in and feasted gloriously on the tubers, crowns and all. This catastrophe might have been prevented by filling up the interstices with dry ashes. I have no doubt that if the stems were cut off to within three inches of the ground, and some ashes placed round them in a conical form, and then some litter spread on the surface, the roots would be found in fine condition in the spring. But this is an objectionable practice in many respects. It leaves the garden in an untidy condition, and takes up room which might be properly occupied with spring bulbs. It is doubtless the case that the roots of Dahlias are less dependent on the place they occupy in the winter than on certain conditions in which they are stored away. I believe they are more frequently injured by early frosts than is imagined, for the effects of such injury do not manifest themselves immediately; all appears sound at first, but the results become evident in a general rottenness before the winter is past. If the tubers are quite sound when taken from the soil, and have not been allowed to become glutted with heavy and continued rains, it will require but little care to protect them. The mould should not be shaken off; all external moisture should be dried off by exposure to the sun and wind, and the tubers in this state may be piled together with the crowns upward. The collection should be looked over once or twice during the winter, lest slugs or other vermin should be slyly committing ravages.

IRIDS, IXIAS, SPARAXIS, AND TRITONIAS.



AMONG half-hardy and greenhouse Irids, Ixias, Sparaxis, Tritonia, etc., are perhaps the most beautiful, and are so easily managed, that persons who have once seen a well-grown collection are surprised that they are not more extensively cultivated—thriving, as they do, in ordinary mixtures of soil, adapted for the flower garden borders, when dry, and merely protected through winter with a surfacing of dry material, only requiring to be preserved from severe frosts until spring; when treated in a cold pit or frame, or placed on the coolest part of the greenhouse platform, dispensing with all attention for

nearly six months in the year, after their annual growth is obtained; and when in bloom producing graceful panicles, or terminal clusters of brilliant salver-shaped blossoms, varying in colour from the richest crimson and carmine, to all the intermediate shades of orange, rose, and red, and also blending the most delicate sea-green with olive centres; yet, notwithstanding all these desirable and attractive features, they are almost lost, and generally neglected in plant collections. When grown *en masse*, they present a glowing combination of the most chaste and brilliant colours to be found amongst flowers, and those who have not seen them cultivated in this way, can form but a faint conception of the splendour of vegetation at the Cape, where myriads of these brilliant objects decorate the surfaces of vast plains. So beautiful, indeed, are some of these, that if the inquiry was made which is the most beautiful and easily managed bulbous flowering plant, I should, without hesitation, answer *Sparaxis* (*Ixia*) *grandiflora*, with its rich, crimson, golden-yellow-eyed, salver-shaped blossoms.

For the special growth of *Ixias* in borders or beds, a south-east aspect should be preferred, which will admit of a partial screen from the mid-day sun. The bottom or subsoil should be dry, and the upper stratum of rich sandy loam, well incorporated with one-third of heath, or dry vegetable mould. Where the soil is naturally heavy, take the soil out to the depth of two feet, leaving the bottom with an inclination sufficient to throw off excessive moisture, on which place six inches in depth of coarse brickbats, and over this add four inches of coarse turf siftings, or decayed branches, well pressed, filling up the remainder with loam. The bulbs may be planted in rows, or groups, at discretion, from two to three and a half inches deep, according to the size and vigour of the bulbs, covering them with about one inch of dry river sand, previous to applying the covering of soil. As a protection from severe frost, the border should be surfaced with dry decayed tan about six inches, or with very dry sand to the depth of three or four inches. The last named material will be sufficient in mild seasons, and may be removed on the approach of spring. When grown in pots for protection in frames, the most suitable compost is one-half friable yellow or hazel-coloured sandy loam, with the remainder in equal portions of well decomposed heath-soil and dry leaf-mould, adding of white or river-sand about one-sixth of the whole amount. The above proportions should be passed through a sieve together (not separately), thereby admitting a more uniform and open texture throughout the mass. The bulbs are generally grown in stores of three to six in each pot, but where great interest is taken in the most beautiful kinds, two bulbs may be placed in a three-inch pot, or in smaller, provided attention be paid to shifting them into larger ones early in spring. Where an effect, *en masse*, is sought, four bulbs in three-inch pots, and six bulbs in five-inch pots will be suitable, the smaller the pots the greater the importance of shifting into larger ones as the bulbs advanced in growth, and *vice versa*. When thus prepared, the pots should be plunged nearly up to their rims in dry tan within the frame or pit, and only watered occasionally as the soil becomes

thoroughly dry ; but this rule must be regulated by the condition of the bulbs when planted : if already vegetating, water must be statedly given, about twice or thrice each week as the weather may require, until vigorous growth begins. Air should be admitted sparingly until the leaves appear, after which it must be uniformly attended to by being gradually admitted early and late, during mild weather, and *visè versa*.

On the approach of severe weather the frame, or pit, must be protected by banking up the outsides with highly decomposed manure, firmly and neatly pressed, to the extent of twenty inches in width at the base or ground level, gradually inclining upwards to within one to two inches of the top ; the remaining protection consists of one or two last mats (dry if possible) placed over the lights in partial frosts, and when much more severe, the addition of dry litter or straw over the mats from back to front, about nine or twelve inches deep, may be advisable. During the kindly influence of sunlight, and milder air by day, the upper covering of straw and mats may be removed from eight or nine o'clock in the morning until three or four in the afternoon, admitting partial air by pushing the lights down at the back about one or two inches, the covering being replaced as required. Towards spring, as the weather becomes warm, careful attention must be paid to watering. The lights should seldom be left entirely off, except in very mild weather and cloudy sky, air being admitted as amply as possible, by tilting each light sideways in the centre, and in all cases from the wind. As the plants progressively show their flower-stems, they may be removed to the greenhouse or conservatory, placed in a light and cool situation, where they will be preserved from extreme drought, or exposure to currents of air. For greenhouse culture, the last-mentioned soils are most suitable ; if potted early, before the bulbs show symptoms of growth, the pots may be placed unplunged either in a cold frame or pit, with a correspondent treatment, or on a shady border (surfaced with ashes), or in the most light and dry place, screened from drip, under the greenhouse stage ; and, as before stated, they should be only occasionally watered until the leaves appear, upon which they must be placed upon the platform, and watered according to their progressive growth. As a general rule, if planted early, during the first month water seldom, but freely, after which they may receive uniform attention with other plants. The following precautions, under each method of culture, appear to be necessary for maintaining a healthy and vigorous condition of growth. The dry and leafy texture of these and similar growing plants, renders them incapable of enduring opposite extremes of drought and moisture, or of long-continued exposure to strong sunlight, or parching currents of air ; therefore during their advancing and mature growth, deficiency of water should be guarded against as the worst evil. "All extremes are dangerous." In fine weather, especially if the pots are small, a gentle syringing or sprinkling over the leaves with a medium-sized broad-rosed watering-pot each morning and evening, previous to the expansion of the flowers, will be found beneficial. It cannot be too strongly enforced upon young plant-

growers, that the operation of syringing, if dexterously performed, ought scarcely to allow of any amount of water to fall upon the soil. Too often the operation is so performed as to equal in its effect a partial watering of the entire plants.

In the *Ixia* border, or bed, should harm be anticipated from heavy rains during winter, it should be averted by placing boards upon an inclined plane over each bed, etc. In the pits or frames avoid giving water if possible on the approach of severe frost. The drier the surfaces of plants and soils, in which they are grown, the greater is their safety from, and power to resist, extreme cold and frost. A medium and prepared state is the best in case of long abstinence from light. During dry, cold and parching winds, avoid exposure of the plants to their direct influence by ventilating or admitting the air opposite to the current; and to avoid the effect of strong sunlight, the blooming plants would, from the period of manifesting such, be greatly benefited by being replunged in decayed tan, within a frame placed in a direct north aspect, from whence, as the blooms were about to expand, they might be removed to the show-house or conservatory. Where this removal to a cool aspect is impracticable, a slight screen or shade with canvas would mitigate the excess of strong light. In the greenhouse similar precautions may be used as to syringing, etc., and if placed upon the part of the platform where the sunlight falls obliquely upon the plants, the better. After the season's growth is matured, by encouraging the growth of the leaves after blooming, the watering should be gradually withheld; and as the foliage becomes generally discoloured from cessation of growth the pots should be removed to a dry frame, all further moisture being withheld, and allowed to rest a few weeks under strong sunlight, with lights over them, to enable the bulbs to elaborate their accumulated secretion of sap necessary for the next season's bloom, from whence they may be removed to any dry airy place until October and November, the most suitable period for being re-excited to growth.

EMBELLISHMENTS OF THE GARDEN.

(Continued from page 314.)



HERE paths diverge, or where the lawn is too open, or where some distant object requires a framing as the eye falls upon it, an arch or arcade is often of great value. An embellishment of this kind may be very speedily made by means of a few stout tree loppings, the rougher and more gnarled the better; or where a couple of limes or alders stand in a position ready for the work, the saw and bill may be set to work to give them the required form, and one season's growth will obliterate any stiffness of outline that might result from a want of skill in the operation. It would be worth while in laying out grounds to plant

November.

a few trees along the margins of walks, expressly to cultivate in this way, so as to construct natural arches, or long alleys, some object of interest being placed at the remote end, to engage the eye and entice the rambler to an inspection of it. Indeed, artificial arbours might in most cases be replaced by natural ones, a little judicious pruning and leading of the trees being all that is necessary to give them any outline we may desire, though that outline should always be as simple and natural as possible. Maples, elms, chestnuts, alders, and limes, are the most suitable for such work ; but you must keep



watch over yourself that you do not too readily yield to the popular love for avenues, for though these are often effective when formed of weeping limes or hornbeam, they generally consume more space than can be afforded for such formal effects.

There are many ways of leading and pruning to compel trees to span a walk, or form a leafy roof to cover a rustic seat. Who does not prefer a seat under a tree,

“Shaking its million leaflets in the sun,”

to one in the confined air of a close timber box, yclept a summer-



house? Here are four examples of this mode of planting and lopping in the construction of natural arbours, whence, by the shortening of the leaders, a vigorous side-growth of the laterals is induced, a roof of greenery is soon formed, that not only excludes the “sun’s perpendicular rays,” but gives shelter during the heaviest summer showers, so that in changeable weather the enjoyment of the garden is not cut short by a flight to the house, or made irksome by the carrying of umbrellas. These arcadian shades are more appropriate positions for rustic seats and resting-places than open lawns

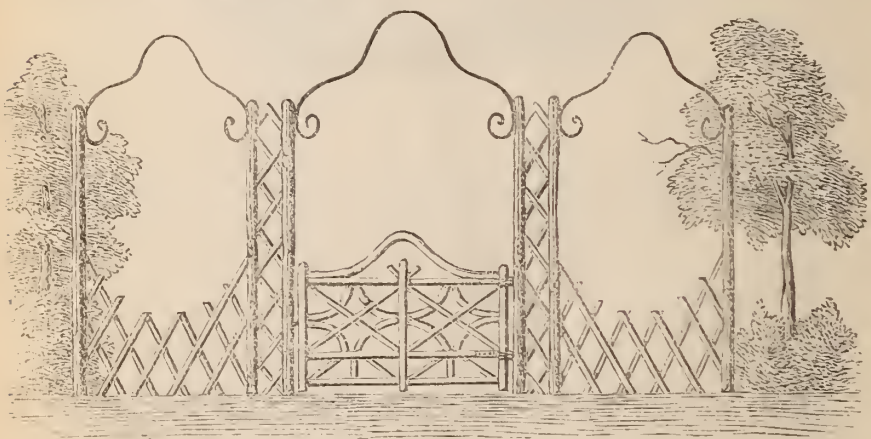
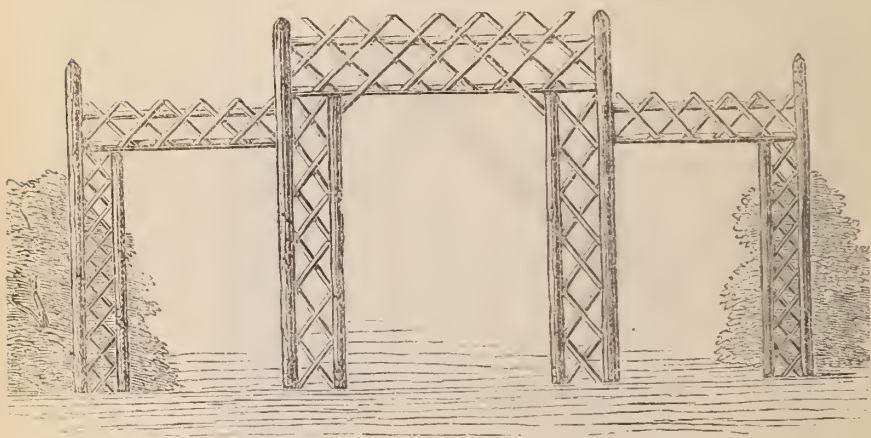
or orderly paths. Not that but a seat may often be well placed as an ornament in any spot where it may prove useful as a place of rest and gossip, and sometimes as an invitation to the enjoyment of a view; yet as a rule a rustic shade is the best position for a rustic seat; it looks useful and appropriate there, and may be embellished with a few rough stones, planted with ferns or other plants that like shade, or a couple may be placed one on either side of the bole of a large tree, and the spaces between them filled up with large root stumps, profusely planted with ivy, periwinkle, toadflax, orchises, and ferns, and a truly rustic and beautiful retreat will be formed without the introduction of a single element that would interfere with the general tone of the landscape, as a summer-house or grotto will frequently do.



Another kind of arch is that formed of dead timber, the materials being unbarked stems selected as to shape, or brought together so as to form a symmetrical span by a little judicious carpentry. An arch of this kind is simple in construction, but produces an agreeable effect by means of a few accessories. The base on each side of the walk should be flanked by a rough lattice of selected tree loppings, and the walk lead to a lawn, in the centre of which should stand a root ornament, covered with a profusion of trailing plants. This and the shrubberies beyond form a picture to which the arch acts as framework, and the eye is gratified by a judicious disposal of a few very simple elements. Contrivances of this sort are particularly useful in small gardens, where broad natural effects can scarcely be thought of.

TRELLISES are of many kinds, and have many uses. Before we

go a step further, we will remind the reader that where climbing plants are trained over wood, brick, or stone, the adoption of a



trellis is most desirable to save the destruction of the surface which must result from the use of nails and shreds. Eyelet rails are obtain-

able at all the good seed-shops and ironmongers. These nails are driven in at suitable distances, and the wires passed through them to form the trellis. The climbers are tied to the wires by strips of bass or the soft lead wire manufactured for the purpose. If a wall is well wired in the first instance, there need not be another nail driven or drawn during the whole of a lifetime. When we have had to cover flat painted wood-work with vegetation, we have obtained large "pea risels," which are simply wire hurdles strongly made, and fixing these firmly, have extemporized a good and lasting trellis at the most trifling cost, and with the least imaginable trouble. The figures adjoined are intended simply as suggestions of trellises for the rosary, or to serve as screens, or even to facilitate the play-



ing of games on a suitable plot of grass. They offer at least two advantages to the owner of a country garden, that the villager would have no difficulty in constructing either of them, and that in many instances materials for the purpose might be found wholly or in part in the rubbish yard.

The best "leading article" for all such work is unbarked larch, but that is by no means essential, for the clearings of the garden will oftentimes afford capital timber, and apple, pear, and plum, last long if sound, and answer admirably for rustic-work.

It is advisable to char and pitch the ends of posts that are to be planted in the ground, to prevent rotting. All wire-work employed should be stout, and instead of galvanized wire, which is so much employed, we should always prefer for home-made work common number one iron wire, and keep it always well painted, especially where joined or twisted, to prevent rust. There is some wear and tear in work well done with such wire as this, and the cost will not exceed that of a lighter material in galvanized wire.

Handsome wire structures are now prepared at low prices by manufacturers of horticultural ornaments, and these, when made to span paths, break angles, or heighten the interest of an object seen through them, are extremely useful. There are all sorts of climbers suitable for these arches, such as the aristolochia, clematis, evergreen, and Boursault roses, creeper-vine, and many rapid-growing and free-flowering annuals.

(*To be continued.*)

PHENOCOMA PROLIFERUM.



THIS is, perhaps, the most useful of the everlastings, and also one of the most attractive of hardy greenhouse plants. It is by no means a difficult plant to manage, but somehow the majority of cultivators do no good with it, for a fine specimen of it is rarely seen, except where growers are within the influence of the metropolitan exhibitions. The most probable cause of the many failures experienced with this plant is, that it will not submit to the starving system without losing its bottom leaves; and in order to counteract its naturally somewhat thin and erect habit of growth, it must be perseveringly stopped, or cut back, as may be requisite to secure a close bushy habit. Beginners should procure well-established strong bushy plants, in five-inch pots, which will afford a fair opportunity of producing handsome specimens, and will be a considerable saving of time compared with obtaining young plants from cuttings. Every care should be exercised, however, to secure well propagated, vigorous, healthy plants; for there are many examples of this plant in nurseries which are only fit for the rubbish heap. In March, the plants should be examined at the root, and if the pot is tolerably well filled with healthy active roots, give a moderate shift, using prime rich fibry peat, broken up into small pieces, not larger than a garden bean, carefully intermixed with about one-third its bulk of clear sharp silver-sand, and some lumpy bits of charcoal. In potting, use plenty of drainage well arranged, and be sure to have the ball, etc., in a proper state as to moisture, and make the fresh soil rather firm in the pot to prevent the water from passing off too freely through it. After potting, place it in the closest part of the greenhouse, or in a pit which can be kept rather warmer than the ordinary greenhouse, and give a very careful supply of water until the roots lay hold of the fresh soil. When growth becomes apparent after potting, the shoots should be cut back as much as may appear necessary to secure a close bushy growth, and after cutting back they should be nicely tied out, keeping them as open as possible, in order to admit light and air to the foliage. Keep the plant near the glass and admit air freely on mild days, for there will be no gain in keeping it close and warm, as this would tend to introduce thin weakly growth but secure a moist growing atmosphere, and draw the syringe lightly over the plant on the afternoons of bright days.

When the weather becomes mild and settled, remove the plants to a cold frame, which will form the most convenient situation for it in summer, and regulate the admission of air, etc., according to the state of the growth.

A thin shade should be thrown over the glass for a few hours on the forenoons of bright sunny days, and the atmosphere should be kept as moist as it conveniently can be. If all goes well, a second shift will be requisite in June, and the plant must not be allowed to suffer for the want of pot-room. Observe the same condition in shifting as recommended above. When the roots are supposed to have got hold of the fresh soil, which will be easily known by the growth, the main shoots must be stopped or cut back in order to throw strength into the side-branches; for if the main shoots are allowed to follow their own course, the plant will soon become very thin and bare at the bottom, and this will not be remedied without a free use of the knife and consequent loss of time.

Discontinue shading as early in autumn as it can be safely dispensed with, and expose the plant more freely to air in order to get the wood firm before winter, for the foliage is apt to become foxy unless the wood is moderately well ripened. Towards the end of September, or as soon as damp cloudy weather begins to prevail, remove the plant to the greenhouse, placing it near the glass, and where it will receive a free supply of air on every favourable opportunity, and give water very carefully during the dull season. If the same treatment as recommended for the first season is practised for one or two more years, the plant should be a nice sized specimen for blooming; but if a large specimen is the object, the plant should not be allowed to bloom too soon. And in the case of a plant intended for flowering the following season, stopping or cutting back must not be practised later than June, as the young wood must be well matured in order to secure a fine display of blossoms. Large thick specimens must all be kept in a rather dry airy situation in winter, and frequently turned round so as to expose all their parts equally to the light and air, but avoid cold north or north-easterly winds. The plant generally opens its flowers about the beginning of June, and it will go on producing a succession of its pretty blossoms until December. But if the object be to keep the specimen in good condition as long as possible, which of course it should be, the plant must never be removed to a close place while in flower, but should be kept in a cool, airy part of the greenhouse, and near the glass, shading from bright sunshine. Also give attention to stopping any shoots which may incline to outgrow the others; and if necessary to keep the bottom well furnished with healthy young wood, the shoots must be cut back, even at the expense of losing a season's bloom. Attention must also be given to shifting as may be necessary to keep the roots properly supplied with pot room, and water must be carefully supplied, especially to large specimens when in a dormant state.

JUSTICIA SPECIOSA.



NOTWITHSTANDING that this plant is hardly surpassed for easy culture, and that it produces a long succession of showy flowers in the dead of winter, it is scarcely ever met with save in a neglected state—the result, no doubt, of its having been long common in collections.

Its management is so thoroughly easy, that it is hardly necessary to make it the subject of an article, and it is chiefly with a view of directing the attention of those to it who are fond of winter-blooming plants that it has been selected; and there can be no doubt that amateurs will find it well worth its room, and the little attention necessary to grow it well.

As usually met with, this *Justicia* presents a leggy, naked appearance, and it is frequently seen in this state where better things might be expected; but this is entirely the result of bad treatment, for the habit of the plant is good, although, like other free-growing subjects, it is apt to lose its bottom leaves and become leggy, under bad management. Cuttings root in a few weeks inserted in a sandy soil, and placed in a gentle bottom-heat; but, in order to secure large specimens for blooming after a season's growth, the cuttings should be put in about August, or so as to allow of having them rooted and well established in small pots before winter. They should be potted off singly in small pots as soon as they are fairly rooted, and placed near the glass in a moist, rather shady part of the stove, or a warm pit, pinching out the points of the shoots as soon as the roots get hold of the soil, and stopping must be attended to during the growing season.

In winter place the young plants in any roomy situation near the glass where the temperature may range towards 50° , and keep them properly supplied with water at the root. About the beginning of March, or as soon after this time as convenient, remove them to where a growing temperature of about 60° is maintained by artificial means, allowing it to rise 10° or 15° with sun-heat and air. Shortly after placing the plants in heat, give them a moderate shift, using about equal portions of good rich turfy loam, peat, thoroughly decomposed cow-dung, or leaf-soil, and sharp sand, well intermixed together. As soon after potting as the roots appear to have started into the fresh soil, stop the shoots, and tie them nicely out, keeping them well down, which will have the effect of causing the bottom buds to start into growth, and inducing a bushy habit of growth to begin with.

As the season advances, and the plants get into free growth, give air freely on mild days, and keep them near the glass. Towards May they will probably have filled their pots with roots, and may then be afforded a liberal shift; and this should not be neglected until the plants suffer for the want of pot-room, and lose their foliage. The same attention to tying out the shoots will be necessary, as recommended after the previous shift, and the plants should be well supplied with water at the root, and also moistened over-head with the syringe on the afternoons of fine days. When summer weather

occurs, the plants may be removed to a cold ground or pit, which can be kept rather close and moist, which, with a little management, will form an excellent situation for them during the summer. A thin shade will be useful for a few hours on the forenoons of very hot days, but this should be used sparingly, and air should be given freely, shutting up early in the afternoon after syringing. Attend to stopping and training, etc., as the specimens advance in growth, and as soon as they appear to require more pot-room, shift into the flowering pots.

If large and fine specimens are desired, they may now be afforded fifteen-inch pots, which will be sufficient for very large bushes; or in twelve-inch pots, if only moderate-sized specimens are wanted, with the assistance of manure-water, will be sufficiently large. Keep the shoots regularly stopped and tied out, as may be necessary to secure close bushy growth, till about the middle of September, after which they should not be stopped; and if the weather begins to prove unsettled, remove them to a light, airy part of the stove, or where they can have the assistance of a little fire-heat. Give them a liberal supply of manure-water after the pots are supposed to be full of roots, and turn them partly round every week, to prevent them growing one-sided. The specimens will commence flowering from the beginning to the middle of December, and will continue to produce an abundant succession of their bright-coloured flowers throughout the winter and great part of the spring; but they must be afforded a temperature of from 50° to 60° , keeping them near the glass, and out of the way of cold draughts; for, although the plant will exist and bloom in the ordinary temperature of the conservatory, its foliage gets discoloured, and it is never seen in perfection save in a somewhat warmer temperature. When the specimens become shabby in spring, they may be severely cut back, and stored away in any spare corner of the greenhouse, keeping them rather dry at the root for a month or six weeks, removing them to a warmer situation by the beginning of June to induce growth.

Turn them out of the pots as soon as they start into growth, and reduce the balls sufficiently to allow of repotting in the same sized pot; and keep close and moist until they get over the operation, treating them during the remainder of the season as directed above, and they will afford specimens of any desired size before winter, and will bloom even more freely than young plants.

PLANTING THE RANUNCULUS.

BY A CORRESPONDENT.



DURING the present month I plant my Turbans; but in general I keep the other sorts out of the ground till the beginning of February. This allows me to expose the soil of my bed as much as possible to the action of frost, and a few fine dry days in spring enable me to commit my tubers to the earth in safety. As to time, a few days earlier or later in planting will not be of much importance, provided the soil is sufficiently dry to allow of its filling up the interstices of the tubers, and securing that firm, yet porous state, so necessary for a healthy vegetation. The day being dry and fine, you may at once commence your operations by nicely levelling the bed, which should be perfectly flat, and not raised in the centre, a practice of which inexperienced persons are fond, and which is so often injurious. As the *Ranunculus* naturally requires a low marshy soil, it will demand, in its cultivated state, a great deal of moisture, and therefore the bed should be below the level of the garden rather than above it, that draught may be repelled as long as possible, and that artificial watering, when necessary, may be most effective.

In levelling, let the surface only be stirred, as some degree of firmness in the subsoil is advantageous to the plant. Have ready the roots in the papers with the names, some neat wooden labels, and a quantity of clean white sand; then, determining to brave the cold wind which may be blowing, and not to be discouraged by the back-ache, proceed to commit to the earth the humble-looking tubers, which in four months are to develop so many beauties. About four inches apart every way is probably the best distance at which the *Ranunculus* should be planted, and the amateur should therefore regulate the size of his bed by the number of roots in his collection, and dispose them equally all over it. With a cord and a small trowel draw a straight furrow across the bed, beginning in the centre and advancing to the edge with successive furrows, that the planted roots may not be interfered with. Place the roots so that the crowns shall be one inch and a-half beneath the surface, when the bed is completed, and having thus filled the furrow with tubers, four inches apart, drop a little sand on each, sufficient to cover it, and draw the excavated soil over the whole. Make another furrow four inches distant from the first, and proceed as before, until that side of the bed is finished. Then operate in the same way with the other side, and the work is done. A slight pressure with the hand should be given to every row as the work proceeds. With regard to the labelling, I have found the following plan the best: As each root is taken out of the paper, write its name on the painted stick with a strong lead pencil, and place root and label in the furrow together. The stick should be about one inch distant from the root, and must be fixed in rather firmly, as I have found the nocturnal perambulations or gambols of a cat sufficient to throw them into confusion. If the writing is always turned the same way, either

towards or from the root, all ambiguity or mistakes will be avoided. Although the genial days we sometimes have in February allow the operations of sowing and planting to be carried on with advantage, it often happens that severe and continued frosts set in after the *Ranunculus* bed is completed, and the hopes of the florist are committed to it. This probable evil must be guarded against; for although the root must sustain a hard frost when it is really rooted, it is very sensitive when that is not the case. If a frost should come, a mat laid upon the bed will avert injurious consequences, or two may be used if the weather is severe. If, in the daytime, the sun has power to unbind the soil, the mats may be taken off, and the warm rays admitted; but be sure the mats are replaced at night. If the weather is suspicious, about three weeks will be sufficient for bringing the young shoots to the surface, when further care as to cold will be unnecessary. An operation must then be attended to of the utmost importance, both to the future bloom and the increase of the tuber. When the leaves are about half-an-inch above the ground, the soil must be firmly pressed round them, so as to fix the tuber firm in the ground. This may be done twice with advantage as the growth proceeds. Lightness of the soil has been very often fatal to the *Ranunculus*, and must therefore be guarded against in the manner just described. The operations which have been mentioned in this paper are rather laborious, from the long continuance of the stooping posture, and they will probably discourage those who are not thoroughly imbued with a love of flowers. But the resolute amateur will remember that no good results are ever secured without toil, and he will be cheered in his labours by the brilliant prospects before him.

PLANTING PEAR TREES.



IN a deep light soil composed of alluvial layers, or in soils that are stony, schistose, calcareous mixed with humus, marly, or marly clay, and when the subsoil does not retain stagnant water during a great part of the winter, the Pear tree on the Pear stock may be successfully planted. If the plantation can be made in such kinds of soil, and in situations, inclined to the east, south, or west, on the side of a hill or slope, so much the better. The more light, stony, or calcareous the soil, the less a sloping situation is necessary; but the more compact, strong, or schistose the soil on the sides of the hills, the better the Pear tree grows and bears. It is only necessary for an attentive observer to travel in the months of August and September, through a country where the pear is generally cultivated, and he will find the above remarks strictly correct. If perfect success is aimed at, we ought never to plant pear trees in ground previously occupied by fruit trees, and which have perished from old age or decrepitude. When an old plantation of fruit trees is to be renewed, it is necessary to remove all the old roots, trench the

ground, and crop it with vegetables for at least ten years. When a regular plantation of fruit trees is to be made, it is far preferable to choose a virgin soil, where, in the memory of men, no fruit trees of any kind have been grown or planted. In support of this opinion, we could state many facts which have come under our observation; but the details would prove tedious to the reader. With regard to the season for planting the pear tree worked on the pear stock, and under the conditions of soil and situation above indicated, it coincides with the fall of the leaves, or a little after, say from the fifteenth of November to the fifteenth of December. In a strong and rather moist soil the planting may be performed after winter, and as late as the middle of March, but we prefer planting before winter. In light soils, plantations made immediately after the fall of the leaves, in the month of November, before hard frosts set in, are always the best. In order that the trees may suffer as little as possible from removal, their roots should not be allowed to dry by exposure to the air. After being taken up they should be immediately packed in damp moss. When the trees arrive at the place where they are to be planted, all bruised fibres should be cut off, and the larger roots that may have been broken in taking up should be cut with a sharp knife, commencing a little from the ends on to the under side, and sloping upwards.

For a tree two or three years budded the holes should be made three feet wide, and two and a half feet deep. If the soil be strong and compact, the holes may be proportionally wider and deeper. It is always advisable to put in the bottom of the hole a layer of good light rich earth taken from the surface of a kitchen garden; and the roots should be covered with some of the same sort of soil. If the trees have been out of the ground for a week or two, owing to some accident, and if the roots are consequently in a dry state, they should be steeped for two hours at least in rain or pond water. In light soil, and in dry weather in spring, it is usual to water the soil well about the roots before these are finally covered. This is done in order to close in the dry light soil about the roots. This watering below the surface layer of soil facilitates the emission of roots, and thereby inures the starting of the tree. When a tree is planted in a hole, dug at least five or six days previously, it ought to be so placed as to have its upper roots about two inches above the level of the ground. The newly-stirred soil in the bottom of the hole will gradually settle, so that the upper roots will ultimately be as low as the surface of the soil. In planting the tree, it is improper to shake or lift it up, for thereby the roots may be imperceptibly broken or twisted. After planting it is advisable to lay a good thickness of light soil over the roots, in order to support the tree against the strong winter winds, and to protect the roots from severe frosts which may occur. After the tree has taken root, this extra layer of soil should be levelled off, in order that the solar rays may exert their beneficial influence on the soil in contact with the upper roots. Trees planted with these precautions succeed the best.

Any one may observe that fruit trees which emit roots from

the neck of the stem, immediately below the surface of the soil, are more vigorous and bear fruit in greater abundance and of better quality than those that are planted too deep, which on the contrary languish and continue unproductive although planted under the same circumstances of soil and situation as the preceding. There is another important point which we cannot pass over in silence. It is a bad practice of pruning or mutilating the trees before planting. This practice is not in any respect a rational one. How, indeed, can it be expected, that a young tree can take well after suffering from transplanting and a change of soil; whilst at the same time it is subjected to amputations which, under the circumstances, it is impossible to heal. Strictly speaking, the branches of a transplanted tree ought not to be pruned till it has taken root, till the buds have pushed by the first flow of sap, or rather after the second, in August or September.

ECHMEA FULGENS.



THE unusual length of time during which this *Echmea* lasts in beauty, renders it one of the most useful plants at present in cultivation. It is extremely suitable for flowering in small pots for furnishing vases in rooms; and being a somewhat striking plant, and capable of bearing the confinement of a close apartment for a considerable time without much injury, it is an excellent subject for house decoration. Plants intended to form large specimens, should be grown on freely the first season, getting the suckers potted early in spring, putting three in a seven-inch pot, and keeping them growing as late in autumn as can be done without drawing or weakening the foliage, and affording them sufficient pot-room, with plenty of heat and moisture. In winter give no more water to the soil than will suffice to prevent it from getting unhealthily dry, and let the plants occupy a cool light part of the stove, in order to check and mature their growth, and insure their blooming. After allowing them six weeks or two months' rest, they may be placed in a bottom-heat, giving the soil sufficient water to properly moisten it, and they will soon be in full beauty. But it will not be advisable to remove them to a cool house while in flower, as this would prevent their making any growth while in that state, and the inflorescence lasts so long in beauty, that this would be a considerable hindrance, where large specimens are wanted without loss of time. In this case, therefore, it will be better to let the plants remain in the stove, placing them where they can be spared from the syringe, and as much out of the way of damp as possible. When the flowering of the plant is over, cut out the spikes, and remove any of the leaves that may be interfering with the young suckers; but do not cut down the shoots that have flowered until this becomes necessary to prevent crowding the suckers. The plants should be now repotted, placing them in a warm part of the stove, and in bottom-heat if con-

venient, and encouraged by plenty of heat and moisture to make vigorous growth. Thin out the young suckers to the proper number for forming a specimen of the desired size, and let this be done before those to be left are injured by crowding, and the old pieces should also be removed in time to prevent injury from them. As to the number of suckers proper to be left, this will depend upon the size of pot, etc., but it is better not to leave too many, as fine strong flower-spikes will not be produced unless the plants are kept moderately thin and grown strong. If all the shoots on a large plant are expected to bloom at once, the specimen must be subjected to a short period of dry, cool treatment, to check and mature the growth; but if a succession of bloom is wanted, this will be the best secured by keeping the plants in growing circumstances to secure a succession of suckers. Treated in this way they will grow and bloom, and furnish a succession of flower-spikes the year round, and will be attractive objects. I am not partial, however, to the system of growing this plant in large masses, for well-grown single plants are, in my estimation, by far the most attractive. Any light rich soil, through which water will pass freely, will be quite suitable for potting, but care should be used to secure perfect drainage, for the roots are impatient of stagnant moisture, which also injures the foliage.

REMINDERS FOR GARDEN WORK IN NOVEMBER.



TULIPS.—Plant the best bed the first week, six inches apart and three inches deep to the crowns, and seven plants in width.

HYACINTHS.—Form beds of them, diversifying the colours, the same distance and depth as the tulips are planted.

DAHLIAS.—Remove to their winter storehouse, which must be dry, perfectly secured from frost, and also heat.

SHRUBS of all kinds may be planted, alterations in gardens should be commenced, box-edges and paths made, general removals of plants of all kinds may be executed.

ROSE STOCKS should be procured and planted ready for budding or grafting; plant them eighteen inches apart in the row, and the rows three feet apart.

WALL FRUIT TREES should be pruned; and, though neglected in all gardens and orchards, standard trees should be pruned as carefully as wall trees, no branches should be in each other's way, and all weak and small shoots should be cut away. Cuttings of currant and gooseberries may be planted.

SOME of the earlier crops, those which we may fairly call speculative, because it is a chance how they stand, may now be got in; a few early beans and peas may be tried, because they are useful if they stand, and no great loss if they miss.

DRESSING and trenching, or digging all vacant spaces, to be left rough, or in ridges to be mellowed by frost, prepares it for spring sowings. Hoeing between crops, and clearing them from their lower leaves that are decaying, must be attended to.

BULBS of all kinds should be planted during the present month, and also potted or glassed for blooming in-doors.



MAYEN: MURRAYI.—UPPER AND UNDER SIDE.
C. MARSHALL. C. TELENDL.

COLEUS.



FEW of the varieties of *Coleus* are gorgeous in their leaf-colouring, and invaluable as bedders; but some thirty or forty kinds, supposed to be "in cultivation," are scarcely better for outdoor purposes than nettles from the hedgerows. To grow these plants is easy enough, provided they can be wintered in a stove or intermediate house, and be propagated early over a tank, or on a good hot-bed. They cannot be wintered in a cool temperature that suffices for geraniums, centaureas, and verbenas, and it is but inviting vexation to attempt it. But given warmth enough, and the matter is disposed of, for they grow with the vigour of nettles if they grow at all. During winter, keep them rather dry, and near the glass, and never allow a drop of water to touch the leaves. Early in spring strike the cuttings in a moist heat of 70°, and pot off the young plants in a light rich compost. Do not be in haste either to turn them out to harden, or to plant them in the beds. The middle of May is early enough to put them in frames, and the first week in June early enough to plant out. The best of all the varieties for out-doors is *C. Verschaffelti*; but *Emperor Napoleon*, *Princess of Wales*, and *Baroness Rothschild* are useful, where more than one sort is required.

For in-door cultivation perhaps *C. Marshalli* is the best of the sombre-toned varieties, the leaf being elegant in outline, and of the richest purple, or red chocolate, with brilliant green eye. *C. Murrayi* also has a fine expanse of leaf, the ground colour bright green, invaded by patches of a fine deep purple colour, while *C. Telfordii aurea*, though small and rather flimsy in texture, is distinct and brilliant in colour, the ground being golden green, shading to buff with a central stripe of purplish red.

BABINGTONIA CAMPHOROSMÆ.



THIS, although not one of the most showy of our hard-wooded plants, has the good property of flowering in autumn, when hard-wooded specimens in bloom are scarce; and being of a free, elegant habit of growth, and flowering profusely as it does for many weeks in succession, it is well worth a place in every collection. It is perhaps one of the easiest of greenhouse hard-wooded plants to propagate; cuttings selected of the young wood in a half-ripe state, and treated in the ordinary way, very soon emit roots. The cuttings should be potted singly, in small pots, as soon as they are moderately well rooted, using nice rich fibry peat in a small state, with a large admixture of silver sand, and placing them till fairly established in their pots, in a close, rather moist pit. Beginners will, however, save time by

procuring good strong young plants from the nursery. If obtained at once, they should be placed in the warmest part of the greenhouse, and as near the glass as convenient. Water must be carefully administered to the soil during winter, giving just sufficient to preserve it in a healthy state, and the plants must be guarded against damp; giving air on fine days, and avoiding wetting the foliage too much. If the plants are supposed to be at all pot-bound, examine the roots, and give a moderate-sized shift early in March, keeping rather close and moist after shifting, and watering very carefully, until the roots get hold of the fresh soil.

During spring the plants should be placed in a pit or house where the night temperature may average from 40° to 45° , allowing it to rise 10° or 15° with sun-heat and a circulation of air, placing them near the glass, and affording them a nice moist atmosphere. Let the branches be nicely tied out, keeping the stronger shoots well down, and pinching out their points, in order to equalize the flow of the sap, and secure a compact, close growth; but stopping should not be performed immediately before or after repotting. When growth fairly commences, take every favourable opportunity of exposing the plants to air, avoiding cold, drying currents, and moisten them overhead every fine afternoon, with a fine-rosed syringe; also give water more freely to the soil. Towards the middle of April, remove the plants to a cold pit, which will be the best situation for them after fine weather sets in, and they will be found to grow much more freely here in summer than in a large or lofty house, where it is always difficult to maintain a moist state of the atmosphere. Should cold drying winds occur after removing the plants to a cold pit, or frame, give air very sparingly, raising the sash on the sheltered side, and use a thin shade to keep down the temperature, but give air freely on fine days, and secure a thoroughly moist atmosphere, by sprinkling the floor of the pit and the plants overhead early in the afternoon, shutting up for the evening, but giving a little air before retiring for the night. A thin shade should be used for a few hours on the forenoons of bright days, but beginners are apt to use this so as to induce thin weakly growth, and this should be avoided. As growth advances, attend to stopping any shoot which may be taking the lead of the others, and keep them nicely tied out. If a second is wanted, let this be given before the roots become pot-bound, and see to the ball being in a proper state as to moisture, and also the soil, for there is considerable risk in shifting pot-bound plants during the heat of summer, and still more if the ball or fresh soil is not in a properly moist state. Remove the plants to a light, airy part of the greenhouse immediately cold damp weather occurs in autumn, and attend to them carefully with water, etc., in winter. If the shoots do not appear as if they would break strongly and make a close growth, cut them slightly back about the beginning of March, and place the plants in the warmest part of the house, keeping them near the glass, and draw the syringe lightly over them in the afternoons of fine days. As soon as they start into growth, examine the state of the roots, and if these are found to be in want of more pot room,

give a liberal shift, and otherwise treat them during the summer, as recommended for last season. If the plants are intended for blooming the following season, however, they should not be stopped promiscuously till late in the autumn, for this would probably cause them to bloom irregularly and sparingly, but they should rather be stopped all over about the middle of August, so as to secure their breaking evenly, and having shoots of about equal strength before winter. And in this case they should occupy a cool, airy part of the greenhouse, until they can be removed to a cold frame, or pit, or until after they have done flowering, for there will be nothing gained by exciting plants intended for flowering too early in spring. They should occupy a cool, shady part of the greenhouse while in bloom, and after the beauty of the flowers is over, cut the shoots back sufficiently to secure a bushy, close growth; also attend to shifting, as may be necessary to afford sufficient space for the roots, and keep the specimens cool, affording them a moist atmosphere until they start into growth, and during the growing season.

PROTECTION OF FORCING PITS AND PLANT FRAMES.



THE object for which protecting materials of all kinds is used is vulgarly to keep out cold, philosophically to prevent the escape of heat; and hence that which with the least expenditure of money and time best secures the object in view must be the best to adopt. The market gardeners round London use principally long litter, and they prepare it through the summer by taking the longest straw from the dung as it is brought from the stables, and this, when it is well shaken out and dried, is formed into a stack contiguous to the frame ground, ready for its winter's use. This is simply thrown over the frames to the thickness of four, six, or twelve inches, according to the severity of the weather, and answers very well. But it is untidy for a gentleman's garden, and moreover makes the glass very dirty, depriving the plants of much light, and rendering a great loss of labour necessary in washing the frames; and also much breakage. It is, however, very surprising how little attention some of the best market growers seem to pay to the importance of light; you may go into their forcing ground in the dark months of winter, when they are forcing cucumbers and other early crops, but you might as well try to look through a fourteen-inch wall, as to discover the contents of the frames through the glass; yet how astonishing is their success! Wood shutters and thatched hurdles have been used since the days of Abercrombie; but if they are durable, they must be awkward and clumsy; and if they are not durable, they become expensive. They have also another and still worse objection, which is, that if not very carefully handled they rub the paint off the sashes. Mats, if they are good, so long as they remain in that condition, are a very effective protection; but thin, hard common mats, as too many of them have been of late years, are dear at any

price. A really good mat, if held by the four corners, ought to hold water for a considerable time without its soaking through, but even the "best Archangel" mats of this description are few. Mats, however, are expensive, troublesome, and littery, and when shabby they are shabby indeed. The price of good mats will average about a guinea per dozen; and supposing each mat to cover three square yards, that fixes the price at 7d. per yard, or, as double mats must be used, at 1s. 2d. per yard annually. Frigi-domo may be compared to a poor blanket; it is a good non-conducting substance, but thin, and I fear not very durable—but still, I should think, as good as mats. Now, it is an established fact, that confined air is an excellent non-conductor, and hence a covering, to be really effective, should be as nearly as can be air-proof, and, of course, at the same time, it will be waterproof. Hence, acting upon this hypothesis, some nine years back, I had waterproof covers prepared for all the pits and frames under my charge; these were made of sail cloth, of which several qualities were offered by the dealers; in width it was something less than a yard, and the expense, at that time, something like 1s. 3d. per yard. This was made up by a sail-maker in cloths of a size suitable for the pits to be covered, allowing six or nine inches to hang over at the back and front of the pits, and being elevated about two inches above the glass, and fastened tightly down, it became both air-tight and waterproof; each cover was fastened at one end to a roller, and the other end was fastened to the frame of the pit, and at the time for covering up nothing more was necessary than to roll the cloth on and fasten it down by strong strings to staples back and front fixed for the purpose; and hence, "Let the storm pelt us" or not, we could retire for the night certain that everything so protected was safe from frost. These covers, with a coat of boiled oil every alternate autumn, lasted for seven years. Of course such a covering in the first outset will be more expensive than mats or other temporary appliances, but the first expense is the last for seven years, and consequently the saving is considerable. With proper care, and applied only to their legitimate purpose, I believe such covers would last several years longer than mine did, and perhaps with some preparation of gutta percha they might be rendered still more durable. But my covers were used for all kinds of purposes, such as shading seed-beds or cuttings in the open ground in the summer, protecting strawberry beds when in fruit from drenching rain, sheltering plants in temporary frames, harvesting seeds, and sometimes protecting the hay-ricks in catching harvest weather; and this last was the most destructive use of all, for the heat caused the oil to liquefy, and hence a good deal of it was lost. For shading during the summer months thin straw mats made with tar-twine, or still better, where they can be procured, reed mats, are very useful, as they may be made sufficiently thin to shade the plants without obstructing much light; but possibly good screens, or hexagon netting, would be still less expensive, and certainly preferable, and more convenient for use.

For purposes of protection I look upon it to be of as much importance to have a waterproof covering as one capable of prevent-

ing the escape of heat; for if on cold stormy nights, or in heavy falls of snow, it runs through the covering, and trickles down the glass, it is quite certain it cannot do so without abstracting a considerable portion of heat in its progress. I think a waterproof and air-tight substantial cloth, supported two inches above the glass, is nearly perfect as can be; and those who make the experiment will find (though expensive at the first) that in a few years they have avoided the general rule in such matters, viz., that of being "penny wise and pound foolish." Where pits are heated sufficiently by hot water or flues, the expense of covering may be avoided; but, in all cases of very severe weather, it will be found more advantageous to cover than to use much firing—not because of the expense of the fire, but to avoid the dryness of atmosphere, inevitable where a high internal temperature has to be maintained at the same time that all the moisture contained in the atmosphere is being condensed upon the cold glass. All forcing houses would be best covered in severe weather, especially where it is indispensable to maintain a high moist temperature; and where fuel is dear, I think the expense of providing good waterproof covering would soon be covered by the saving in fuel. It may not be out of place to give our great horticultural builders a hint, which, if carried out, would offer considerable facilities to gardeners in large establishments, and that is, in making a new garden to have the whole of the sashes of the same size, so that the sashes of a late might be placed over an early Peach house or Vinery, and thus form the best covering that could be had for such a purpose. In the practical management of covering, of course it is important in severe weather that cold pits and frames should be covered up before the glass becomes frozen, and while there is yet some heat in the frame; in continued frosts such pits are better covered up than exposed in the daytime if the atmosphere is dry, and indeed with the cloth covers sufficient light is admitted for all plants in a state of hybernation for several weeks together, especially if care be taken afterwards not to expose the plants to strong sunlight, until they have been exposed to moderate light for some few days.

ANGELONIA GRANDIFLORA.



THIS is a really useful plant for summer decoration, producing spikes of pine-apple scented flowers very freely, and remaining in beauty for months; being also of quick growth and easy culture, useful sized specimens of it may soon be obtained. Cuttings selected of short-jointed, rather firm bits of the young shoots should be put in early in summer, placing them in a moderate bottom-heat, where, with proper care in watering and shading, etc., they will emit roots in a few weeks, and may then be potted singly in small pots. Replace them in a warm, moist situation after potting, and guard them from the direct rays of the sun until they become established in their

pots, when they should be gradually inured to a free circulation of air, and placed near the glass. Let the young plants be stopped as frequently as may be necessary to secure a bushy habit of growth, and attend to shifting when they require more pot-room. With ordinary management strong, bushy plants in seven-inch pots may easily be obtained by autumn from cuttings rooted in spring, and these with common care will form specimens of almost any desired size the following season. The plants are somewhat liable to damp off in winter unless properly treated, therefore place them near the glass in a light airy part of a house where the temperature is kept at about 50° by fire-heat, and give water sparingly while the plants are in a dormant state. Early in February cut back, and tie out the principal shoots sufficiently to secure a thick, bushy habit of growth, and place the plants near the glass in a warm house, and thoroughly moisten the balls in order to induce active growth. Also see to the state of the roots shortly after placing the plants in heat, and give a liberal shift to such as are found to require more pot-room, and water carefully until the plants get into free growth, but moisten them overhead with the syringe in the afternoons of fine days, and maintain a moist atmosphere. As the season advances, give air freely on fine days, and attend to stopping any shoots that may incline to outgrow the others, and keep them nicely tied out, so as to promote a bushy habit of growth. When good sized bushes are obtained, which, with good management, will be the case by May, discontinue stopping, and in order that the flowering shoots may be as dwarf as they can be obtained, keep the specimens near the glass, and admit air rather freely on fine days, keeping the shoots thin by staking. If the specimens appear to want more pot-room, this should be seen to as soon as they start into growth after the final stopping; and if they are expected to continue growing and flowering the greater part of the summer and autumn, they must be afforded sufficient space for their roots. When they are fairly in bloom they may be removed to a warm corner in the conservatory or show-room; an occasional watering with weak, clear manure-water will be of great service in maintaining them in a vigorous healthy state, and securing a succession of flower; and if necessary, they may be cut over, and removed to a warm situation, where they will soon throw up an abundance of young wood, and flower profusely a second time.

When the specimens become useless for decorative purposes in autumn, they may be thrown away at once, as young plants grow so rapidly that it is useless wintering large bulky old specimens; but be provided with young plants before throwing away the old ones. Any light, rich, fibry soil, such as equal parts of loam, leaf-soil, and peat, with a proper admixture of sand, will answer perfectly for the growth of this plant; but a small proportion of well decayed manure may be added with advantage at the last shift, and good drainage should be secured.

WEEDS ON LAWNS.



THE beauty of a grass plot or lawn is so much dependent on its being free from weeds, that I think my commentary would be incomplete if a few observations were not made on this branch of my theme. I have sometimes seen operations upon a large scale in order to eradicate moss; but I think, that unless excessive in quantity, it forms a luxurious carpet, and in extensive grounds is useful to cover the surface where little else can grow. In the more distant and sequestered portion of pleasure grounds, I prefer the mossy bank, overhung with umbrageous foliage; but in the formal quadrangles of mansions and colleges, neither moss nor weeds should grow. Such plots, with the margins of walks in terraces, their slopes, and the formal patches of grass, which frequently form part of a design, should be free from moss, daisies, and all broad-leaved plants, including the coarser grasses, such as the Couch-grass (*Triticum repens*), and the Cocksfoot (*Dactylis glomerata*). There is no plant which detracts so much from the beauty of our English lawns as the common Daisy (*Bellis perennis*). Sorry am I to lay such a charge upon this "modest, crimson-tipped flower," associated as it is with our happy recollections of childhood, when all that was gay and pleasant seemed made for us alone, and we dreamed not that the same field which yielded us daisies and buttercups, produced also nettles and thistles. But while I would do it ample justice as a wild flower, which—

"Opens with perennial grace,
And blossoms everywhere,"

I confess to have found it my greatest plague, particularly in the earlier spring and summer months; after the lawns have been neatly mown, "swept and garnished," a few hours of sun have studded them with these flowers, producing a frittered effect, and destroying that agreeable contrast which a well-kept lawn always gives to masses of flowers, particularly those of a scarlet colour. In gardens where there are many large trees, the better grasses will not thrive, but even if annually renewed, as annually perish; in such places the daisy and moss alone will thrive, and therefore in all such spots I would not disturb them, but take their verdure as the best instalment we can have for the effect of turf. On the contrary, wherever level open spaces prevail, more particularly in scenes which are highly artistic, the daisy has no place. The quadrangles of the colleges at Oxford have long been celebrated for the beauty of their grass-plots; and I remember that at All Souls' College I have seen the most perfect specimen of a well-kept lawn I ever beheld; not a daisy, or broad-leaved plant of any kind, but one uniform, dark green, velvety surface, such a one as perfectly accorded with the artificial expression of the venerable buildings, and was evidence of the design and influence of highly civilized and erudite men. Beautiful as were the daisies and golden dandelions of our childhood,

and much as we regard their beautiful forms and wise adaptation as a link in the great charm of nature, we hail their absence from such classic regions as a boon. One of our poets has immortalized the daisy in these lines—

“The Rose has but a summer’s reign,
The Daisy never dies.”

Now it is precisely for these ever-blooming and “never” dying qualities that we gardeners banish them from our lawns. They may be ranked in the first class of our “forget-me-nots,” and every gardener may truly say of them what the poet said of the rosemary, “That’s for remembrance.” Next in order, as weeds on lawns, come the Dandelion and Rib-grass, or plantain; these are the only ones which become troublesome when grass is moderately well kept. But what is deficient in quantity is compensated for by the facility with which great quantities are produced from seeds. The practice of neglecting the mowing of grass as a point of economy is not to be commended, because it gives these pests an opportunity of propagating themselves to an almost incredible extent, not only stocking the grass with their frequency, but also the walks. The task of cleaning a foul lawn is indeed a serious one, but one which will amply repay, where high keeping is necessary; and like all other undertakings, it may be accomplished by a little perseverance. When once got under, they may, by a little regular appliance, be easily kept in subjection. The best workman for the purpose is a boy from twelve to fourteen years of age, who need only be thus occupied in dry and suitable weather. The best instrument is the Daisy-digger; it has a handle like that of a large chisel, into which is fixed a piece of iron, which is bent upwards at the end, and forked thus \approx . It is necessary to take out the entire root of these plants, and therefore advantage should be taken to do it after rain, the operator placing the forks under the leaves of the plant, and pressing the handle gently down, the plant is drawn out of the earth, the point of fulcrum being that where it begins to curve. I fear that my remarks may be thought tedious upon this simple subject; but as “trifles make the sum of human things,” it is evident that to do great things well we must not despise little ones. My maxim through life has been—that what is not worth doing well is not worth the attempt. Often have I seen persons on grass delving and pottering with a short weeding knife to extract weeds, when the use of the Daisy-digger would have done double the work in a more efficient manner.

HEXACENTRIS MYSORENSIS.



THIS is certainly a very beautiful plant, and its value for decorative purposes is very much enhanced by its long drooping racemes of singularly formed bright yellow and crimson blossoms, being freely produced in the dead of winter, when the best furnished collections possess few if any twining plant, which for general effect can be compared with this. It is, moreover, a plant of extremely easy culture, forming a large specimen or covering a large space in a very short time, and is well worth a place wherever there is a warm house for it. Those who do not possess it should obtain it soon, in order that it may be got into growth early in spring, so as to secure large plants for blooming next winter. The young plants should be placed in a warm part of the stove by the beginning of February, and as soon as they show any indications of growth examine the roots, and if these appear to want more space shift into a pot a good size larger. If a mild bottom-heat can be commanded, this will assist in encouraging the production of roots. Before starting the plant into growth any weakly shoot should be cut out, and the stronger ones may also be shortened back to prominent eyes. Keep the plant as near the glass as convenient, and the atmosphere moist, syringing overhead every fine afternoon, but do not give too much water at the root until it starts into free growth. If it is intended to train the plant to a trellis it should be shifted into the pot in which it is intended to bloom it as soon as possible, in order to be able to train the shoots as they grow; and a plant that is well rooted in a seven-inch pot may be safely transferred to a fifteen-inch pot, which will be large enough for any reasonable sized specimen. But as the beautiful blossoms are borne on drooping racemes, these are apt to find their way inside the trellis, and get partly hid by the foliage if an ordinary shaped trellis is used, and except in the case of those who have some particular object for growing it on a trellis, it would be better to allow it to run along wires under the roof of a stove, or intermediate house. Treated in this way it will be decidedly more showy than when confined to the limits of even a large trellis, and will bloom longer and more profusely. I would not, however, advise that it should be planted out in a border, for it is of a very free habit of growth, and probably would flower but sparingly if its roots were allowed to have too much space. If a trellis is used, it should be spread out at the top, somewhat in the form of an umbrella, so that the flowers may hang clear of the foliage and shoots, of which there will be a large mass before it will bloom freely; and for a plant in a fifteen-inch pot the trellis should not be less than four feet across; for just in proportion as the shoots can be exposed to light in autumn will be the number and size of the racemes which they will produce.

The plant need not be kept too warm after the trellis is well covered with wood, as a slight check will assist in inducing it to bloom freely; and in the case of plants trained under the rafters in the stove, they should be kept rather dry at the root, and as freely

exposed to air as circumstances will admit, while those that are movable may be removed to a cooler house for a month or so. They should be removed to a light, airy part of the stove for blooming, and when the racemes begin to appear thickly, manure water may be given once or twice a week with advantage. See that the foliage is quite clear of red spider before blooming commences, as heavy syringing after that time would be apt to spoil and break off the flowers. I have no doubt that where it is desirable to have this plant in bloom late in spring, that it may be wintered in a house where the temperature is just high enough to save the foliage (58° by fire-heat will be quite sufficient for this) and roots from injury, and will bloom splendidly when placed in a moderate heat in spring, but it is perhaps most valuable for winter use. If young plants are provided to succeed those that have bloomed, the old plants may be thrown away as soon as their beauty is faded, but if they are to be retained for further use, they should be well rested before starting them into growth a second time, and the shoots severally thinned out, reducing the ball sufficiently, so as to allow of giving them a good shift in the same sized pot. About equal parts of turfy loam, leaf-soil, and fibry peat, with a fair proportion of sharp sand, may be used for potting, but any rich, light soil will answer, for it does not appear to be particular in this respect.

PENTSTEMON SPECIOSUM.



NOTHING can be more charming in the flower garden than a bed filled with this plant, properly treated and in full bloom; but this beautiful Pentstemon is seldom to be seen in cultivation under any circumstances, and the reason always assigned is that it is difficult to manage. This, however, is not the case; on the contrary, if properly treated, few plants are more easily cultivated. I will therefore point out how it should be treated, for the guidance of those who may be desirous of cultivating one of the handsomest hardy herbaceous plants our gardens possess. The Pentstemon was first introduced by Douglas, from the north-west coast of North America, where apparently it is very abundant. It is, however, very variable both in colour of flowers, size, and shape of the leaves, and also in stature, some plants attaining four feet, others not more than two feet in height; in some plants the foliage is broad and nearly round or spatulate, particularly the lower leaves; while on other plants it is long and narrow, and most frequently lanceolate, even the radical leaves; some plants, again, have no leaves upon their stems, beyond the first whorl of flowers, while others have leaves, intermixed with the flowers to near the top. The flowers, as I have stated, also vary much both in shape and colour; some are short, inflated, and very ringent; others (on separate plants) are more tubular, larger, and much less ringent. They also vary greatly in colour; some being

very pale blue, others deep azure blue, and on some plants even reddish purple; but all this happens on separate plants, which are capable of being raised from seeds, although without any certainty. A pale-flowered variety of this plant has been published in the "Botanical Magazine" under the name of *Pentstemon Gordoni*, from the eastern side of the Rocky Mountains; but it is not sufficiently distinct to be separated from the original species, even if perpetuated by cuttings. The seeds should be sown as soon as they are ripe in the autumn, for if not sown until spring they will probably remain dormant until the following March, which is the case with those of most *Pentstemons* from the north-west coast of America and California. The seeds should be sown in pans or large pots, in pure sandy loam, without any mixture whatever, and should be placed in a cold pit, or frame for the winter, where they will require no further care until the following spring (beginning of March), when they should be removed to a warmer situation, where there is plenty of light and air (the greenhouse is a very suitable situation), and where they may remain until the middle of May, when the young plants should be potted, taking care at all times that they never suffer from the want of water, with which they should be liberally supplied. In potting, place each plant singly in a 60-pot (three inch), and use a compost composed of three parts sandy loam and one of well-decayed cow-dung; afterwards place the plants in a close pit or frame, and water freely for a few days, until they recover the effects occasioned by the shift; afterwards give air freely, and when the weather becomes very warm and the sun bright, about midsummer, place the plants in a frame with its face to the north, shading them in very bright sunshine, but fully exposing them during the night and in dull weather. They may remain in this situation until the end of August, when they should be shifted into larger pots, using the same kind of compost as before, and giving a liberal supply of water. When shifted they should be placed in an airy situation, where they are partially shaded from the sun, until the end of October, when the strongest plants should be planted out in a bed in the flower garden, made rather rich and fresh, with sandy loam and rotten dung; the smaller ones should be again transferred to a cold pit or frame for the winter, where they will be free from damp or stagnant moisture at their roots, and where they may remain until the end of the following March, when they may also be planted out in the flower garden as before, making the soil very rich for them with rotten dung. These plants will then make a good succession to those planted in the autumn; they must be freely supplied with water in very dry weather, but never over-head, for if watered over-head they very soon canker and lose their stems, and as their stems are easily blown over or broken off by the wind, they should be fastened to slender stakes about the beginning of June, and it would be very advisable to place hand-glasses over the plants planted out in the end of October, to protect them in case the winter should prove very severe and damp, for although they are seldom killed by cold, they are very impatient, and soon injured by frost and damp together, particularly in spring.

Thus treated, this fine *Pentstemon* will bloom from the end of June to September, and produce abundance of seeds, which should again be sown as above stated, for in reality the plant is not more than a *biennial*, and requires to be raised every year from seed to keep up a succession. When an account of this plant was first published, it was stated to be a perennial, and this led many to suppose it was difficult to preserve for any length of time.

JUSTICIA CARNEA.



SOME plants, though really valuable, grow so rapidly and form specimens with so little skill and care, that good growers seem to consider them unworthy of attention, and they soon fall into unmerited neglect, through being left to the care of indifferent cultivators. To this class belongs the plant at present under notice, which, although of the easiest possible culture, forming superb specimens in a very short time, and blooming most profusely two or three times in a season, is seldom met with except in a neglected state. Those who had the pleasure of seeing the fine example of this *Justicia* which was exhibited in the Horticultural Society's rooms some years ago, will readily agree with me when I say that it is well deserving more attention than it at present receives. The specimen referred to was about three feet in height, upwards of four feet in width, and was covered to the edge of the pot with flower-spikes, the number of which was 156. The plant was struck in April, and shifted into a seven-inch pot in August, in which it was wintered, keeping it in a cool house, and rather dry at the roots. In the beginning of March it was shifted into a fifteen-inch pot, and placed near the glass in a house where the temperature ranged from 50° to 64°, with fire-heat. Here it was afforded a slight bottom-heat, a moist atmosphere, and a free circulation of air whenever the weather would permit. This plant being impatient of an excess of moisture at the roots, water was applied very sparingly to the soil, until it was evident from the growth of the shoots that the roots had got good hold of the fresh soil; indeed, beyond syringing morning and evening, very little water was given. The plant is a very rapid grower, and very much inclined to become leggy and thin at the base, which stopping will hardly prevent, as the back buds do not break freely, and the centre shoots always have an inclination to take a decided lead over the others. To remedy this, the shoots were pegged down, bringing them almost down to the surface of the soil, which caused the back buds to push, and when the points of the old shoots turned up and showed a tendency to grow too fast for the others, they were stopped, and any shoot towards the centre which seemed inclined to rob its fellows, was pegged down so as to equalize the growth. Early in May the plant produced ten fine spikes of blossom, and was removed to the flower-house, observing, of course, to prepare it for the change. When the beauty of the flowers was over, the spikes were cut off,

the shoots shortened, cutting out some of the weakly ones, and it received no water at the roots for some ten days, and was placed in a cool airy position. It was now returned to the house in which it was previously grown, freely supplied with water at the root, and received the same attention as to pegging down the shoots, with the view of equalizing the growth. The weather being now warm, the lights were entirely drawn off on bright hot forenoons, but they were replaced early in the afternoon, after syringing, thus maintaining a moist growing atmosphere at night, and whenever it could be done, avoiding, at the same time, the etiolating effects of a hot shady situation. The buds broke very freely under this treatment, and strong short-jointed shoots were produced. In July it bloomed a second time, when it produced ninety-two spikes. It was removed to the flower-house, and managed, after the decay of the flowers, as last time, and, when rested, placed in a mild bottom-heat. The only different treatment observed this time was to feed the plant with clear weak manure water, which was rendered necessary through the pot having become full of roots, and the soil somewhat exhausted; and, as a matter of course, the lights were not removed when the weather became so cool as to render this unnecessary. In September the plant produced 156 heads of bloom, in which state it was exhibited. The soil used was rich fibry peat and loam, in about equal proportions, well mixed with sharp gritty sand, and a slight sprinkling of bone-dust. Young plants grow so rapidly that, except in the event of a large specimen being wanted in bloom early in the season, it is never worth while to winter large plants. Were it desirable to do so, this plant might be kept growing and blooming the whole season round. But the flowers do not colour well in winter, and it is impossible at that season to afford the amount of air necessary to have compact good specimens.

SELAGO DISTANS.



TF this plant bloomed in spring or early summer, it would probably soon disappear from our collections, for the peculiar odour of its foliage is not agreeable to many persons, and the flowers being destitute of colour, are not particularly striking; but, notwithstanding these little faults, the plant is likely to be long a favourite. Its easy culture, free habit of blooming, and the length of time which the plants remain in beauty during the dull season, fully entitle it to be considered one of the most useful for winter decoration in cultivation. Cuttings rooted early in spring, and treated rather closely during the summer, will form nice-sized specimens, and bloom profusely from the middle of November to the end of January; but persons who wish large specimens, and those with little accommodation for growing the plants rapidly, will probably find it better to propagate them, and get them well established in five-inch pots the previous season. Firm bits of the young wood planted in sandy, peaty soil,

December.

covered with a glass, and placed in a shady part of a moderately warm house or pit, will soon be sufficiently rooted to bear potting singly. Place the young plants in a close, shady situation for a fortnight after potting off, and as soon as they get established remove them to a cool, light, airy situation, and stop the shoots regularly, to induce compact, bushy growth. When the pots become full of roots, which will soon be the case, give a small shift, and keep the plants growing slowly during the autumn; and as long as it can be done without danger from frost, expose them freely to the night dews. In winter place them near the glass in the greenhouse, or wherever they will be safe from frost and damp, and give sufficient water to the soil to keep this in a moist, healthy state; and I may observe that, as the plant roots very freely, and grows slowly during the winter, it requires a larger supply of water at that season than most greenhouse plants. Unless with the view of obtaining monster specimens, active growth need not be promoted by artificial means early in spring, but the plants should be placed in a close part of the greenhouse early in March, or, if more convenient, may be removed to a pit, the temperature of which may range a few degrees higher than that of the ordinary greenhouse. But it must be borne in mind, that if strong, vigorous wood is to be obtained, air must be freely admitted whenever the weather will permit, and the plants must occupy a position near the glass, where they will receive all the light possible, and the temperature should not exceed 50° , except with air and sunshine. If the balls are full of healthy roots, repot at once, giving a rather liberal shift, but otherwise defer this until active growth commences, which, if the plants occupy a rather close place, will soon be the case. This *Selago* is not particular as to soil, and will grow freely in any light rich compost; but the following will be found to suit it perfectly, and should be used where convenient. Turfy, sandy loam, fibry peat, and leaf-mould in about equal proportions, with a quantity of sharp silver sand added to keep the mass porous. Let the loam and peat be nicely broken up, and the whole be well intermixed together; and in potting, make the fresh soil rather firm about the ball of the plant. As soon as the roots appear to have taken to the fresh soil, admit air very freely, except during cold drying winds, and expose the plants to all the light possible. Also stop and peg down the shoots, or tie out the stronger ones, which will admit light and air among the branches, and induce stocky, robust growth. A cold frame will be the best situation for the specimens, and to this they should be removed as soon as the state of the weather will allow of doing so with safety, and be inured to full exposure to sun and air, merely using the lights as a protection from cold drying winds and storms of rain. It will be advantageous to have the frame so placed in summer as to be shaded for a few hours in the forenoon from the sun. About a month or six weeks after potting, it will probably be found that the pots are full of roots, and in this case another shift should be given at once, which may be into the flowering pots. The size of these must be regulated by taste and convenience; twelve-inch will be large enough to produce good-sized specimens; but the

plant is such a vigorous grower, that there is little danger of over-potting. It will be advisable, however, after giving a large shift, to keep the atmosphere rather close and damp, and syringe the plants overhead morning and evening, till the roots lay hold of the fresh soil. When this is the case, the plants will grow very rapidly, and the main shoots will require to be stopped occasionally, and a few stakes may probably be needed to keep the specimens open; but if the plants are grown slowly, very little attention will be required to secure handsome-shaped specimens. When the weather becomes unfavourable in autumn, remove the specimens to the greenhouse, where they will soon be covered with blossom, which will be produced on every shoot. If the plants are properly supplied with water, and guarded from the effects of damp, they will remain some three months in beauty. I have found clear weak manure water useful in prolonging the season of beauty. Young plants are so easily got up, and occupy so little space, compared with old specimens at this season, when every available corner is filled with something, that I remove the specimens from the flower-house to the rubbish-heap, taking care to have a sufficient supply of young plants; but there is no doubt that by cutting the plants back closely, and wintering them in a cool place, they will be serviceable a second season.

ROELLA CILIATA.



HERE it not for the difficulty of managing this plant, so as to keep it in a healthy state, it would doubtless be one of the greatest favourites in cultivation; but it is so exceedingly liable, even in the hands of the best cultivators, to assume a rusty appearance, and under any circumstances is so short-lived, that it is seldom met with. It is, however, by no means impossible to produce moderately handsome specimens, and to preserve them in good condition for a season or two, and the profusion of beautiful flowers, and their long continuance in beauty, will repay any amount of attention which can be bestowed on its culture. The great mistake generally committed in regard to its management, is growing it in a moist, warm atmosphere, till too late in autumn to allow of properly ripening the wood before winter, and exposing it suddenly, in a soft state, to a cold, damp atmosphere, which disfigures the foliage, and greatly injures the health of the plant.

Beginners should endeavour to obtain a compact, bushy plant from the nursery, at the earliest opportunity; and if a healthy plant is procured at this season, it will be evident that it has been well propagated and properly cared for; and, having secured a good foundation, there will be no impossibility of growing a good specimen. No part of the treatment of the *Roella* is more important or more generally misunderstood than its winter management. At this season it should be placed near the glass, where the temperature

may be kept at about 45° by fire-heat, and where the atmosphere can be kept moderately dry, without exposing the plants to currents of cold air on its entrance into the house. Any excess of moisture at the root, or allowing wet to hang about the foliage while the plants are in a dormant state, is sure to ruin or disfigure them, therefore never apply water to the soil until it is absolutely wanted, and then give enough to thoroughly moisten the ball, and avoid wetting the foliage, except to remove dust, etc.; and let this be done, when necessary, on the morning of a bright day. In the case of plants that grow slowly, and are particularly susceptible of injury while in a dormant state (and our present subject is one of these) it is found a good practice to start them into growth as early in spring as circumstances will admit, which provides for a long growing season, and also for getting the wood well-ripened up early in autumn. With the convenience of a light house, or pit, where the temperature may range about 55° at night, and some 10° higher with sunshine and air, there will be no danger in starting the *Roella* into growth early in February, as after this season, with proper attention, strong vigorous growth will be easily secured. Before placing the plants in circumstances to excite growth, prune away any weakly or disfigured points of the shoots, and if the pots are full of healthy roots, give a small shift; but unless the roots really require more space, it will be safer to defer shifting until growth has commenced. In potting, use the very best fibrous peat, broken up into small pieces, and carefully selected, with which mix about one-third its bulk of sharp silver sand, and a quantity of potsherds, and observe to have the ball and soil in a properly moist state, and also to thoroughly drain the pots. The fresh soil should be pressed rather firmly about the old ball, and for the present be raised a little round the outside, to prevent the water running off the old ball through it, which is apt to be the case unless provided against. After placing the plants in growing circumstances, the same treatment will be proper, whether first repotted or not, and the greatest care must be exercised in either case, to avoid over-watering until the roots get into action. The shoots should be tied or pegged down, to induce the buds towards the base to start, so as to secure bushy specimens. If the atmosphere is kept moist it will hardly be safe, except on the mornings of bright days, to syringe the plants overhead until the sun is sufficiently powerful to soon dry the foliage, but advantage should be taken of every fine morning to moisten the wood. When the plants start into free growth, a more liberal supply of water will be required; and as the days lengthen, the syringe may be used without fear of injuring the foliage. Considerable care will also be necessary to properly regulate the temperature, so as to secure strong, vigorous growth; if the latter is found to be weakly, remove the plants where air can be freely admitted, until a more vigorous root action shall have been induced, and endeavour, during the growing season, to regulate the temperature, etc., so as to induce rapid strong growth. The best situation in which to grow this plant during summer, will be a small pit, the temperature of which may be regulated according to the state of the specimens.

keeping it moist and warm, or dry and airy, according as the growth may show to be necessary. It will also be beneficial to throw a slight shade over the glass for a few hours on the forenoons of bright days, but this should not be used except when absolutely necessary, and ought to be discontinued early in autumn. Attend to shifting as may be necessary to afford space for the roots, and regulate the last shift for the season, with a view to have the pots moderately well-filled with roots before winter, and stop and tie out the shoots so as to maintain a close compact habit of growth. Growth should not be encouraged late in autumn, but the specimens should be gradually inured to full exposure to sunshine, and a free circulation to air, in order to ripen up the young wood and prepare it for winter. The same treatment must be pursued the following spring, cutting back the shoots sufficiently early in the season to maintain a close bushy habit, and shifting as may be necessary; but if the specimens are intended to bloom in autumn, stopping must not be practised after May. When in bloom the specimens will do very well in a quiet corner of the greenhouse, but avoid exposing them to sudden changes of temperature, and maintain a dry atmosphere to prolong the beauty of the blossoms.

VERONICA ANDERSONI.



THIS handsome Speedwell is certainly one of the most useful plants we have for autumn and winter decoration. It blooms very freely, its long spikes of charming flowers afford a long succession, and it is as easily cultivated as any of the older species. Cuttings of the firm pieces of the young wood root very freely, and if taken off the plants early in summer, inserted in sandy soil, placed in a shady part of a moderately warm house, and after potting singly, afforded a cold frame, they will make nice plants in six-inch pots in the course of the season. The young plants may be wintered either in the greenhouse, in a cold frame, or wherever they can be protected from frost, and afforded all the light and air possible; beyond which, and a proper supply of water, they will require very little attention at this season.

When growth commences, which will probably be the case about the middle of March, give a liberal shift—say into pots two sizes larger than those in which the plants have been wintered, and place them in the closest part of the house or pit, to encourage the roots to strike into the fresh soil. If the plants are bushy, with several shoots each, as they should be, do not stop at present, but peg or tie out the stronger branches in a regular manner, bringing them down as near the surface of the soil as can well be done with safety, when the points of the shoots will turn up, giving air freely on fine days, and maintaining a moist atmosphere, syringing overhead on the mornings and evenings of fine days, which will be of great service towards inducing the production of short-jointed healthy wood. If

in good health and making vigorous growth, the plants will soon fill their pots with roots, and as soon as this may be the case, they should be repotted, giving a liberal shift—say into twelve-inch pots, in which size large handsome specimens may be produced. Use good strong fibrous loam, with a liberal admixture of sharp sand and lumpy bits of charcoal or potsherds, which being more retentive of moisture, and this plant being a somewhat gross feeder, and apt to suffer if allowed to become over-dry at the root, either during the growing season or while in bloom, is more suitable than a lighter compost. In summer a pit which can be kept rather close and moist, and where the plants can be placed near the glass, will form a very suitable situation in which to obtain active vigorous growth. During the early part of the season keep the branches tied out, so as to admit light and air, and stop the shoots regularly over as often as may be necessary to maintain a close, bushy habit; but stopping must be regulated according to the time at which it may be desired to have the specimens in bloom. Plants intended for blooming in autumn and early winter should not be stopped later than the end of June, for there is no possibility of securing a fine display of blossom except by allowing the plants to make a regular growth after stopping, and getting this well ripened up, then affording a short period of rest; and I have no doubt that neglect of this has been the great cause of the want of success in the culture of this fine subject, of which so many amateurs have complained. By attending to this little peculiarity of the plant, there will be no difficulty in securing a fine display of blossom at any period of the season when it may be most desirable; whereas if this is neglected, the finest grown specimens will only produce a few straggling heads of blossom.

When good-sized specimens are obtained they should be removed to a dry, airy situation, where they will be fully exposed to sun and air, giving a sparing supply of water at the root to ripen up the wood. If not wanted for early flowering, they may be allowed to remain during winter in a warm part of the greenhouse, giving very little water to the soil, and guarding the foliage from damp while the plants are in a dormant state. Treated in this way it will be easy, by merely removing the specimens to a moist, warm temperature, to throw them into bloom at almost any season, and they will remain some three months in beauty if afforded a moderately warm temperature, and guarded from damp. When the beauty of the flower is over, the strongest shoots may be cut back, the plants turned out their pots and disrooted, so as to allow of repotting them in the same sized pots; or if large-sized specimens are desired, a moderate shift should be given, and then grown as directed for last season. Managed in this way the plants will last in good health for several seasons, but old specimens should be liberally supplied with manure-water, both during the growing season and while in blossom.

STYPHELIA TUBIFLORA.



PLANTS which bloom in winter and early spring, if but of ordinary merit, must be set down as valuable, inasmuch as they assist in furnishing a supply of cut bloom, and keeping the flower-house gay at a season when blossoms are scarce, and therefore more prized than at other periods of the year. But the fine habit, the elegantly-shaped and variously-coloured blossoms with which this plant is covered for some two months together, would render it a favourite, even if it could be had in bloom only at the season when blossoms are most plentiful. Although not difficult to propagate, like most hard-wooded plants, this roots but slowly; and as good plants may be purchased from the nursery for a trifle, perhaps its propagation had better be left to the trade. In choosing, be careful to select healthy dwarf, bushy plants; winter them in a light, airy part of the greenhouse, giving a careful supply of water, beyond which they will require very little attention at this season. About the middle of March turn them carefully out of their pots, and if the balls are well filled with healthy, active roots, shift into pots two sizes larger than those in which they have been growing. After potting place them in the warmest end of a greenhouse, or in an intermediate house, where the night temperature may range about 50° or 55° , and where a moist growing atmosphere can be maintained to promote a vigorous root action and a free growth. The shoots should be nicely tied out, bending down the points so as to regulate the flow of the sap, and prepare the buds on the lower part of the shoots for starting into growth. Having given a liberal shift, there will be some danger for a time, of overwatering the soil, or allowing it to become too dry, either of which errors would greatly injure if not ruin the specimen. These dangers, however, are easily avoided by having the soil and the ball in a nice moist healthy state at the time the operation is performed, making the fresh soil pretty firm about the old ball, and syringing the plants overhead morning and evening until the roots get hold of the fresh soil, after which they will require a liberal supply of water at the roots. When free growth commences, any over-strong shoot should be cut back if necessary, to secure a close bushy form of growth; but if the shoots are tied out as directed, cutting back will hardly be necessary in the case of well-grown young plants. A higher temperature than that already directed should not be maintained by means of fire-heat, and when free growth has commenced air should be freely admitted on every favourable occasion. In summer this plant enjoys a moist atmosphere, slight shade from the mid-day sun, and a free circulation of air, without exposure to drying winds; and perhaps a cold frame affords the most convenient situation for securing these conditions. By placing a stratum of small coal ashes, six inches deep, in the bottom of the frame, water is absorbed, and given off in the form of atmospheric moisture whenever the air becomes dry, and by raising the lights on the sheltered side, a circulation of moist air is secured

which is of the greatest consequence towards obtaining rapid growth, and shading, etc., is more conveniently effected here than elsewhere. During the early part of the summer, the sashes should be shut down early in the afternoon, after moistening the specimens overhead with the syringe, raising them late in the evening; and on soft, warm nights after the middle of July, the sashes may be left off for the night, exposing the plants to the night dews. A second shift will probably be required about the end of June; this, however, will depend upon the health of the specimens, etc., and should be given as soon as the pots may be filled with roots, both to prevent any check of the growth at this season, and also to get the pots moderately well filled with roots previous to winter. In September the plants should be gradually inured to full exposure to sun and air, removing them on the occurrence of cold damp weather or drenching rains, to a light airy part of the greenhouse, and supplying them very carefully with water, especially any recently potted specimens. If the young wood has been properly ripened, an abundant display of blossoms may be obtained at almost any time after November, by removing the plants into a gentle moist heat, but unless the wood has been well matured it will be better to leave them to bloom in the greenhouse. After blooming, cut back the shoots pretty closely, and allow the plants a fortnight's rest in a cool house, giving very little water to the soil; then remove them to a moist growing temperature, and as soon as they start in growth shift into pots a size larger, observing the same caution in watering, etc., as directed for last year. As soon as active growth commences, give air more freely, and gradually prepare the plants for removal to the greenhouse, from which they should be removed to a sheltered place out of doors for the summer, but care must be observed not to suddenly expose them to bright sunshine; indeed, a situation shaded from the forenoon sun should be afforded them during summer. By using means to check the growth early in autumn, and to get the wood well ripened in September, the plants may be had in bloom most of the winter. The *Styphelia* requires a soil comprised of prime rich fibry peat, with a sufficient admixture of sharp silver sand, to insure the rapid percolation of water through the mass after the decay of the fibre, and a sprinkling of lumpy charcoal or small potsherds is also useful.

EMBELLISHMENTS OF THE GARDEN.

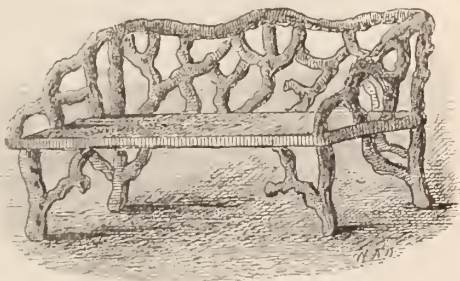
(Continued from page 344.)



ARTIFICIAL stone is not always to be depended on, for it is sometimes found to consist of common plaster coated with cement. This would not matter provided the duplex material would hold together with the integrity of a homogeneous mass. But it happens that when frost follows long continued rain, the outside cement and the inside plaster expand in different degrees, and when the thaw takes

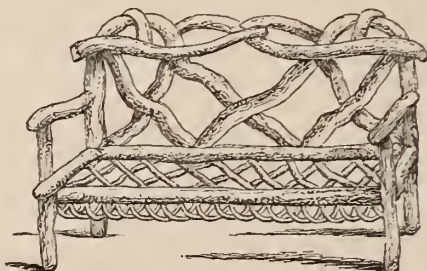
place they part company. Then the beauty of Venus and Adonis is seen to be but skin deep, and the gigantic vase from which the floral scrolls have fallen, has less elegance than the pile of clinkers that make hideous the grand entrance to a genuine cockney's garden. As remarked in a preceding page, however, artificial stones of many distinct kinds are now manufactured, and many of them equal stone both in durability and beauty of texture, so that unless we employ the sculptor to make demonstration of his skill in Carrara marble, we may do well to adopt these patented substitutes, which are as cheap as they are good, and for the most part cast in such artistic designs that they will merit to be regarded as works of art. We quite regret that our fixed rule of action precludes the recommendation of some of the patented stones, but the warning offered as to the compounds of cement and plaster may have some practical value for the reader. Iron, of course, answers well in place of stone, if designed for the purpose, and kept in good condition by regular cleaning and painting. But the texture betrays it, and the paint is an undesirable accessory—we should always prefer for decorative works intended for pictorial uses only, stone, or its nearest imitation, to iron, but where a mechanical strain is to be borne, as in a balustrade or centlivre for example, iron of course will sweep every other material out of the field for strength and elasticity.

RUSTIC FURNITURE is often badly made, and of the worst materials. In purchasing expensive articles of this class it is necessary

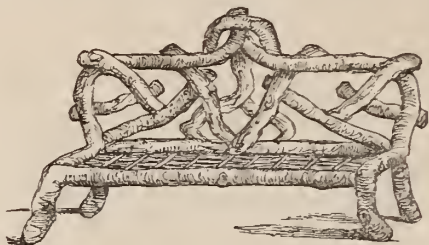


to guard against obtaining timber in which dry rot has commenced, though as to "guarding against" this contingency is no easy matter. Until within the past ten years or so, manufacturers in the eastern parts of London made use of cheap oak timber, the produce for the most part of the pollard oaks of Epping Forest. This soon began to decay within by dry rot, which seldom gave any outward sign, so that a rustic structure in which the process had long been active, would preserve its respectable appearance until the final collapse came, when it would subside into a wreck, and, to the owner's surprise, be found to have long before consisted only of an outer shell of varnish or paint, and a mass of mere dust within. Those portions of the forest from which this treacherous timber was obtained are now enclosed and cultivated; but in many another district a similarly bad material may be in use to the injury of pur-

chasers and the discouragement of taste in gardening. We cannot propose a test for the guidance of the purchaser, although a section of the timber would probably reveal to a microscopist the presence of the fungus by which dry rot is produced. But having paid dearly for our knowledge of this stuff, we advise the rejection of



wood in which small worm-holes, like the piercing of pins, are visible, for these appear to precede and prepare the way for the insidious fungus. A good test of soundness is density: if the wood is heavy, and when struck gives forth a semi-metallic ring, it is likely to be sound. The best of timber, however, requires proper



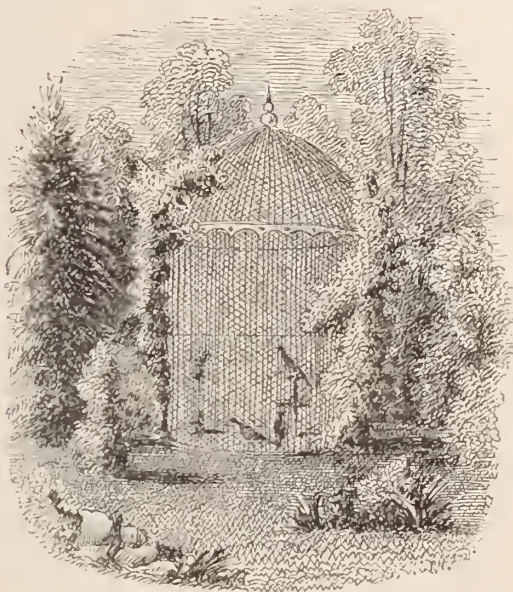
management in the workshop, or the work will not hold together, and decay will quickly attack the materials.

The seasoning process is the one grand step towards honest work in the making of rustic furniture, and the purchaser may sometimes



be able to judge pretty fairly by the visible practice of the yard whether the wood is seasoned or not. In the remarks on various rustic ornaments we have recommended in some few instances the employment of unbarked poles, but we are bound to add here that for all general purposes it is better for the bark to be removed by

steeping the wood in hot water, for it may peel off on its own account when the work has taken its final place in the garden, and render it unsightly, and a prey to weather. When the bark is removed, the timber presents a naturally polished surface, in many instances, as, for example, yew, holly, and oak, extremely beautiful, and susceptible of improvement by the application of a preservative coat of varnish. And here we will again remark that wood in its natural colour, or at most with the improvement of a stain, is much to be preferred to painted wood, whenever circumstances admit of its use with propriety. Even common deal plank, when employed as the inner lining of a summer-house, only needs to be coloured with oak stain and varnished to present a fine mellow appearance, far more in



unison than paint would be with a garden scene, especially if varnished yew, holly, and oak, and unbarked hazel rods and pine-cones, constitute the principal ornamental features. One word more on this subject. Varnish is varnish all the world over, and needs no explaining; but sometimes oil is rubbed in as a substitute, and another substitute is a mixture of gold size and boiled linseed oil. These are good preservatives, and afford a good tone of colour, but utterly inadmissible on any part of the wood-work which one's dress is likely to come in contact with. As to the oil, *pur et simple*, it generally sinks into the texture of the wood, but remains unabsorbed about the neighbourhood of hard knots, to make oily prints of those knots upon the backs of those who submit themselves for the operation. As for the second, it never becomes thoroughly hard,

and on a hot summer's day, if you sit for half an hour leaning against a surface treated therewith, you may find it a difficult task to get away home again—you will be glued down like a limpet, and when pulled off by strong friendly hands, will surely find that you have left a photograph of the event in the form of a film of wood or what else on the treacherous varnish. Yet one word more. All receptacles for earth, such as baskets, etc., should be pierced to allow escape of surplus water, and should be coated with pitch inside. So too the feet of all chairs, baskets, and so forth, should be touched with hot pitch sufficient to make the sole impervious to moisture, and when these are placed in positions they should stand on bricks or tiles, rammed into the proper places previously. By taking these precautions the life of your rustic work will be considerably prolonged.

Wire work should of all things be strong, and suited to the particular purpose for which it is employed. Very much of the low-priced wire netting we see advertised is worse than useless, for being frail and subject to decay and damage, we may some day lose all our pheasants or other valuable birds that have been entrusted to its keeping.

In selecting wire netting for any particular purpose, it is a good plan to have the largest mesh allowable, and to have the strongest work made of that size. Generally speaking, iron rods are preferable for the frame-work of an aviary to any kind of woodwork, but the latter must be used more or less, and it is specially serviceable where anything like ornament is attempted. Galvanized wire has its uses, and is certainly not to be condemned; but the caution may be useful that the best of it will not last for ever. What is it? Nothing more than iron coated with zinc; and consequently, wherever the iron is exposed to the atmosphere, as it must be in places where the wire has been cut, there oxidation takes place, and decay proceeds at a rapid rate. Some of the better productions are galvanized after all the work of cutting and forming is complete, in order to give a coating of zinc to the joinings and rivets. But this is of course impossible with works of any great extent, and those who would build well are advised to finish the work with two or three coats of paint, which should be renewed every third year.

Wire netting is frequently employed to confine poultry and ornamental fowls in narrow runs which scarcely deserve the name of aviaries, though in strict truth they are such. In constructing these, flat roofs should never be adopted, nor, indeed, should a flat roof in wire-work be employed for any purpose in the open air. One heavy fall of snow, remaining a few hours on a flat wire roof, however strong, will be likely to weigh it down and drag the uprights with it out of gear, and may even bring down the whole affair with a crash, to the destruction, perhaps, of all the inmates.

Wire baskets, and even wire flower-pots, in endless variety of design, are offered by the manufacturers of garden ornaments, and, generally speaking, they are good. But strength is of the utmost importance, especially if they are intended to be filled with earth and planted. Into such baskets we should prefer never to put

earth at all. If we had to furnish such with flowers, we should first give them a coat of tar to prevent destruction by damp, then fix two strong rods across to form a letter X horizontally, to give strength; then fill them with moss, and in that plunge potted plants.

FRUIT-TREE BORDERS.



FRUIT trees, of whatever kind, should be planted on shallow ground, more especially if the quality of the soil is adhesive. As a first principle, the border should be dry; and, if not naturally so, drainage, complete and efficient, must be introduced. The drainage must, from its depth, entirely prevent the roots from getting beyond it. The soil between the drainage and the atmosphere should be rendered friable by exposure to the elements, and when it partakes of considerable tenacity I would urgently recommend an admixture of stones, flints, brick-bats, or any similar material, say to the extent of one-fourth. These will enable the rains to percolate freely through the body of earth in which the roots are. They will also in dry weather hold moisture, and tend greatly to maintain the border in an equable state. The roots under such circumstances will be satisfactorily placed; no water can remain or be held in the soil sufficiently long to prove injurious, the stones intermixed with the soil will allow it freely to pass into the drainage beneath, where preparation must have been made for its passing readily off. No kind of fruit-bearing tree should ever be planted deep, the proper position of the roots in planting is to stretch them carefully on the surface of the border, then to cover them loosely with soil to the depth of three inches; on this lay a slight covering of decayed leaves, merely to protect them from drying winds until the roots are perfectly established in the soil. The roots are certain to find their way downwards, but when they are down they are not so likely to find their way towards the surface. Fruit tree borders should never be dug with the spade. The surface may be stirred and kept open with the fork, and then merely for the purpose of loosening the soil. The roots should be encouraged to the surface by the application of dressings of decomposed leaves. Wood-ashes will occasionally prove useful, and so will soot. These encourage the kind of wood likely to prove productive, and the produce is entirely different both as regards size and quality, from that when heavy dressings of stable manure are applied, particularly when the borders are imperfectly drained and the soil of considerable adhesiveness. Manure dug into the borders thus circumstanced is only increasing the evil. The soil is constantly wet and spongy. The roots are surrounded with unhealthy fluid; and the air never penetrates beyond the surface; consequently, rank and barren wood, in large quantities, is annually, and to no useful

purpose, produced. The roots should never be allowed, if it can possibly be avoided, to get beyond the reach of atmospheric influences. It is in such a position alone that they can procure and assimilate the kind of aliment indispensable to the fruitfulness of the trees. When the borders are imperfectly drained, the fruit produced is not only small in quantity, but of inferior quality, and not fit for dessert or kitchen use, compared with such as is grown on dry and healthy soil. Where the situation is bad, it should not by bad gardening be made worse; every means should be adopted to modify an evil of itself of sufficient magnitude. I should hope that nobody would ever think of planting trees in future without a complete examination of the condition of the soil, and particularly the subsoil, in order, if necessary, to apply those remedies which skilful gardening may suggest; and surely there is sufficient skill and talent amongst us to meet, if brought into the field, all thy exigencies of the case.

REMINDERS FOR GARDEN WORK IN DECEMBER.



ALL HALF-HARDY SHRUBS, FUCHSIAS, and other plants, not capable of standing hard frost, should have litter laid about their roots and up their stems. Tender roses should be taken up and laid in by the heels in a shed or out-house, where the frost will not reach them, and covered with straw or litter.

HEARTSEASE and **PIXES** should have litter over them, in case of hard weather.

TULIPS should be covered against frost, which, though not killing, is injurious to the blooms if it reach the bulbs: those in the outer beds, though not, perhaps, of so much importance as the test or show bed, may have hoops and mats over them with advantage.

CARNATIONS, PICOTTEES, and **AURICULAS,** as well, indeed, as all plants in pits or frames, should be kept pretty dry, and in mild, dry weather have all the air that can be given by taking off the glasses altogether. All dead leaves should be taken off, the surface occasionally stirred, and the greatest care should be taken that no snails or slugs harbour among the pots, and that the bottom of the pits or frames be dry.

The roots of tender fruit-trees should be protected in hard weather with straw and the stems of vines outside of houses, when the heads are growing inside, should be bound down and otherwise protected with straw; the roots also of those against walls should be covered with litter; most wall-fruit trees, being earlier excited, should be also covered with litter.

If the weather be mild, the vegetable garden should have the management of last month continued.

In bad weather, in-door work should be attended to, the making of labels preparation of sticks and stakes, the breaking of old pots in small pieces to use as drainage, and shifting them through different-sized sieves; examining all kinds of tubers, seeds, and other subjects, to see they are taking no damage—are all duties which are necessary during the winter, and should be done when nothing can be done out of doors.

In dry mild weather, alterations, planting, and various pruning work should be done, and the cuttings gathered up and stacked for fuel, or burned to put the ashes on the ground. It is also in the winter season that manures and soils should be collected, and the heape turned over to mix well by the time they are wanted. No weeds should be allowed to grow among the compost. The principal soils, etc., to collect, are road-scrappings, loam, cow-dung, horse-droppings, sand, etc.



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